STATE OF NEW YORK
DEPARTMENT OF CONSERVATION
WATER POWER AND CONTROL COMMISSION

The Ground-Water Resources of Chemung County, New York

By
W. S. WETTERHALL
U. S. Geological Survey

Prepared by the
U. S. GEOLOGICAL SURVEY
in cooperation with the
NEW YORK WATER POWER AND CONTROL COMMISSION

BULLETIN GW-40
ALBANY, N. Y.
1959

STATE OF NEW YORK

DEPARTMENT OF CONSERVATION

WATER POWER AND CONTROL COMMISSION

The Ground-Water Resources of Chemung County, New York

By

W. S. WETTERHALL

U. S. Geological Survey

Prepared by the

U. S. GEOLOGICAL SURVEY

in cooperation with the

NEW YORK WATER POWER AND CONTROL COMMISSION

BULLETIN GW-40

ALBANY, N. Y.

1959

STATE OF NEW YORK

DEPARTMENT OF CONSERVATION

WATER POWER AND CONTROL COMMISSION

SHARON J. MAUHS.....*Conservation Commissioner*

JOHN W. JOHNSON.....*Superintendent of Public Works*

LOUIS J. LEFKOWITZ.....*Attorney General*

JOHN C. THOMPSON.....*Executive Engineer*

UNITED STATES

DEPARTMENT OF THE INTERIOR

Fred A. Seaton, *Secretary*

GEOLOGICAL SURVEY

THOMAS B. NOLAN.....*Director*

LUNA B. LEOPOLD.....*Chief Hydraulic Engineer*

A. NELSON SAYRE.....*Chief, Ground Water Branch*

GEORGE C. TAYLOR, JR.....*District Geologist*

185

CONTENTS

	Page
Abstract	1
Introduction	1
Purpose and scope	1
Acknowledgments	2
Previous reports	3
Well-location system	3
Geography	3
Climate	3
Drainage	4
Topography	4
Geology	5
Geologic history	5
Consolidated rocks	5
Portage formation	6
Chemung formation	6
Structure	6
Unconsolidated deposits	6
Deposits in the uplands	7
Deposits in the valleys	7
Elmira-Horseheads valley	8
Horseheads-Big Flats valley	11
Big Flats-Elmira valley	11
Lower Chemung River valley	11
Post Creek valley	12
Catharine Creek valley	12
Cayuta Creek valley	12
Ground water	12
Water-level fluctuations	13
Occurrence of water	15
Consolidated rocks	15
Unconsolidated deposits	15
Sand and gravel	17
Till	17
Silt and clay	17
Utilization of water	17
Quality of water	18
Mineral constituents	18
Hardness	18
Temperature	21
References cited	21
List of ground-water bulletins	Back cover

ILLUSTRATIONS

Page

Plate 1. Map of Chemung County showing location of wells . . (In pocket)

Figure 1. Map of New York showing location of Chemung County and other areas in the State for which reports have been published or where investigations are in progress 2

2. Graph illustrating the range in size of the constituent grains of sandy gravel (1), till (2), and clayey silt (3) 7

3. Sections showing the unconsolidated deposits along the Chemung River in the southern part of Elmira 9

4. Map of the Elmira area showing the location of selected water wells and test holes 10

5. Hydrographs of wells Cm 83 and Cm 84 and monthly precipitation at Elmira 14

6. Map of Chemung County showing yield of the unconsolidated deposits 16

TABLES

Page

Table 1. Chemical analyses of water from wells in Chemung County . . . 19

2. Comparison of the quality of ground water in Chemung County with standards of the U. S. Public Health Service 21

3. Logs of selected wells and test holes in Chemung County 22

4. Records of selected wells in Chemung County 37

The Ground-Water Resources of Chemung County, New York

By W. S. WETTERHALL

ABSTRACT

Chemung County comprises a land area of 407 square miles in the south-central part of New York. The entire county lies in the glaciated portion of the Allegheny Plateau physiographic province. The climate is humid continental, the mean annual temperature is about 49°F, and the mean annual precipitation is about 33 inches.

Ground-water supplies are obtained both from bedrock, which underlies the entire county, and from unconsolidated glacial deposits, which overlie the bedrock in most, though not all, parts of the county. The bedrock is composed of sandstone and shale of Devonian age. The average yield of bedrock wells is 8 gpm (gallons per minute) and the maximum reported yield is about 200 gpm. The average depth of bedrock wells is about 100 feet.

The unconsolidated deposits consist of till and of stratified deposits of gravel, sand, silt, and clay. Till is generally the uppermost deposit in the uplands and in minor valleys. In the major valleys, it may either overlie or underlie outwash deposits. Till is generally rich in silt and sand, and is capable of yielding water in usable quantities to wells of large diameter only. The stratified outwash gravels and sands yield up to 1,000 gpm to properly developed wells. Wells that yield water from gravel are usually less than 50 feet deep and are equipped with screens. In the sandier phases of the outwash, gravel-packed wells are used.

The outwash gravels are underlain by lacustrine silt and clay. Because of their low permeability, the silt and clay may not yield water in quantities adequate for domestic needs even to large-diameter wells.

Ground water in the county is of generally acceptable quality for domestic and other uses, though much of it is hard and higher in iron content than is desirable.

INTRODUCTION

Purpose and Scope

This bulletin is one of a series which presents the results of ground-water investigations made in New York by the U. S. Geological Survey in cooperation with the New York State Water Power and Control Commission. It provides information on the occurrence, quantity, and quality of ground water in Chemung County. Figure 1 is a map showing Chemung County and other areas for which reports have been published or investigations are in progress.

Data on which the report is based include records of more than 600 water wells, logs of more than 150 wells and test holes, and chemical analyses of water from more than 50 wells. These data are summarized in tables 1, 3, and 4 of the report. The locations of the wells and test holes are shown on plate 1 and figure 4. It should be noted that most of the well data, with the exception of measured depths of wells, lengths of casing, and yields, were given from memory by individuals who were interviewed during the collection of the data. The section on geology is a synthesis of pertinent literature and notes made in the field.

Most of the well records on which the report is based were collected by Harry Wilson, Willard Winslow, and James Ziarno. Charles S. Denny of the General Geology Branch aided in the study of glacial deposits. The field work was under the supervision of Joseph E. Upson, formerly district geologist of the

New York-New England District, and Erwin S. Asselstine, formerly geologist in charge of the Upstate New York subdistrict. The preparation of the report was under the direction of George C. Taylor, Jr., district geologist, and Ralph C. Heath, geologist in charge. Both the field work and the preparation of the report were under the general supervision of A. N. Sayre, chief, Ground Water Branch, U. S. Geological Survey, and John C. Thompson, executive engineer, State Water Power and Control Commission.

Acknowledgments

The author gratefully acknowledges the helpfulness of the New York district office of the Corps of Engineers, U. S. Army, and the Bureau of Soil Mechanics, New York State Department of Public Works, which furnished well logs and other pertinent information. John G. Broughton, state geologist, and other geologists of the New York State Museum provided general assistance and advice. Among the well drillers or well-drilling firms that made their records available and who gave generously of their time and knowledge are Mr. C. W. Crandall, Pine City; Guaranteed Drilling Co., Elmira; Mr. Barney Moravec, Penn Yan; Superior Drilling Co., Horseheads; and Mr. William Vanderhoff, Jr., Lockwood. Messrs. John Copley of the Elmira Water Board, Wayne Ferguson of the Horseheads Water Department, H. Kentz of Wellsburg, and Alden Lanphear of the Beaver Valley Subdivision furnished pertinent data on public water supplies.

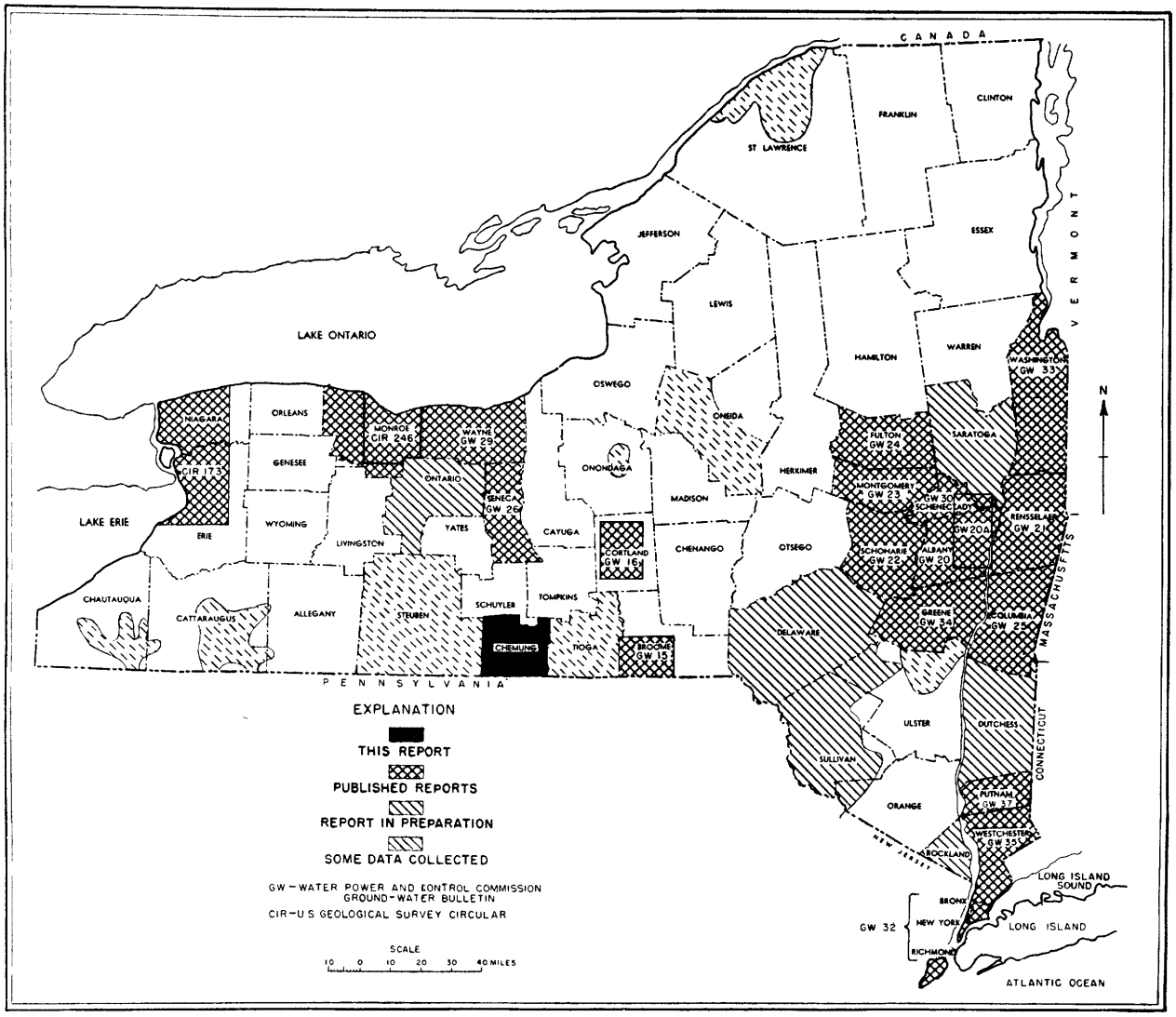


Figure 1.—Map of New York showing location of Chemung County and other areas in the State for which reports have been published or where investigations are in progress.

Previous Reports

A detailed account of the geology of Chemung County and adjacent areas in New York is contained in U. S. Geological Survey Folio 169 by Williams, Tarr, and Kindle (1909). A report by Tarr (1905) contains a brief discussion of the water resources of the area. Weeks (1904) in a discussion of the groundwater resources of the State includes records of 11 wells in Chemung County, and in a later report (1905) mentions two "commercial springs."

Well-Location System

The locations of wells for which records are contained in this report are shown on plate 1. The wells are numbered serially in the order in which the records were collected, and each number in Chemung County is preceded by "Cm." However, the prefix has been omitted from the well numbers on plate 1, because all wells shown are in Chemung County. As an aid to locating wells in New York State, meridians of longitude at 15-minute intervals are lettered consecutively from west to east, beginning with "A" for meridian 79°45′, and ending with "Z" for meridian 73°30′. Similarly, parallels of latitude are numbered at 15-minute intervals from north to south beginning with "1" for parallel 45°00′ and ending with "17" for parallel 41°00′. Intersections of the coordinates form points from which the location of an individual well can be described by distance and direction. All well and test-hole locations in Chemung County are referred to the intersection of coordinates "12" and "M," which coincide, respectively, with parallel 42°15′ north latitude and 76°45′ west longitude. The distance in miles and the direction from this intersection are given in the "location" column of table 4. For example, well Cm 1 (12M, 16.8S, 8.1E) can be found by locating the point where lines "12" and "M" cross and measuring 16.8 miles south and 8.1 miles east.

GEOGRAPHY

Chemung County is near the center of the tier of counties forming the southern boundary of New York. Most of the county lies between meridians 76°33′ and 76°58′ west longitude and parallels 42°00′ and 42°17′ north latitude. It is bounded on the north by Tompkins and Schuyler Counties, on the east by Tioga County, on the south by the State of Pennsylvania, and on the west by Steuben and Schuyler Counties. Its total area is 407 square miles.

The population of the county in 1950, according to the United States Census, was 86,827. Of this total, 49,716 resided in Elmira, the county seat and only city in the county. Approximately 70 percent of the total population resides in the Elmira metropolitan area, which includes the city of Elmira and the villages of Elmira Heights, Horseheads, and Southport.

Climate

The climate of Chemung County is humid continental, characterized by cool summers and long, moderately cold winters. According to the records of the U. S. Weather Bureau, the mean temperature for January, the coldest month, is 28°F and for July, the hottest month, 72°F. The extremes in temperature at Elmira are 107°F, recorded in 1953, and −24°F, recorded in 1904. The mean maximum and mean minimum temperatures are 59.4°F and 39.1°F. The mean annual temperature during the period 1931 to 1952 was 49.2°F.

Moist air masses, moved by cyclonic storms from the Gulf of Mexico and the Atlantic Ocean, are the principal sources of moisture for the county. The prevailing westerly winds contribute only a small amount of moisture but are important in that they cause eastward migration of low-pressure systems, which induce movement of moist air into the area. The mean annual precipitation was 32.72 inches for a period of about 50 years prior to 1931 and 35.51 inches for the 22 years from 1931 through 1952. Mean annual snowfall for the 22 years from 1931 to 1952 was 40.7 inches. Precipitation exceeds 0.01 inch on an average of 107 days each year (Mordoff, 1949, p. 61). The precipitation is generally evenly distributed throughout the year although the period from May to August tends to receive more than other periods of comparable length.

Drainage

More than nine-tenths of the county is drained by the Chemung River and Cayuta Creek into the Susquehanna River. The remainder, a small area of 36 square miles in the north-central part of the county, is drained by Catharine Creek, a part of the Lake Ontario drainage system. The principal streams and the area in Chemung County drained by each are shown in the following table:

Drainage basin	Stream	Area (sq. miles)
Susquehanna River	Cayuta Creek	53
Do.	Chemung River	318
	Seely Creek	144
	Newtown Creek	80
Lake Ontario	Catharine Creek	36
	Total	407

The largest stream, the Chemung River, enters the county from the west, near Big Flats and leaves it at the southeast corner. The peak flow of Chemung River at Chemung, as measured on May 28, 1946, by the U. S. Geological Survey, was 132,000 cfs (cubic feet per second), or 52.17 cfs per square mile of area drained. The average flow of the river during the 51 years from 1903 to 1954 was 2,489 cfs, or 0.98 cfs per square mile. The lowest flow, 49 cfs or 0.02 cfs per square mile, was recorded on August 14, 1911. Most of the Elmira metropolitan area is drained by Newtown Creek, a tributary of the Chemung River. The maximum recorded flow of this creek during the 17-year period from 1938 to 1955 was 3,460 cfs, or 43.25 cfs per square mile, on December 30, 1942. The average flow of the creek during the same period was 87.3 cfs, or 1.09 cfs per square mile. The flow of the stream practically ceased, temporarily, on August 17, 1938.

The advance of ice sheets across the area in Pleistocene time altered the course of many of the streams. The most striking alteration was the diversion of the Chemung River between Big Flats and Elmira. Prior to glaciation, the Chemung River flowed through the broad valley that extends eastward from Big Flats to Horseheads and thence southward to Elmira. During Pleistocene time a tongue of ice, advancing southward down the valley that is now occupied by Catharine Creek, dammed the Chemung River near Horseheads (Engeln, 1945, p. 109) and formed a lake in front of the ice dam. The level of the lake rose until it reached the altitude of the lowest divide in the area between Big Flats and Elmira. The outflow from the lake across this divide cut the channel now followed by the Chemung River.

Topography

Chemung County lies in the northern, glaciated part of the Allegheny Plateau physiographic province (Fenneman, 1938). Topographically the area is characterized by flat-topped hills having rounded shoulders and steep lower slopes and by broad, deep, flat-bottomed valleys. The flat hilltops reflect the nearly horizontal attitude of the underlying sandstones and shales, which are generally close to the surface in the uplands. The rounded shoulders of the hills appear to be remnants of broad, shallow valleys that were deepened by the ice sheets in Pleistocene time as they moved down the valleys. The lower, steeper slopes of the hills extend downward nearly to the relatively flat valley floors. The valley floors are underlain by glacial drift, which in some of the larger valleys is several hundred feet thick. The drift is relatively thin or absent on the hills. Because the drift is considerably thicker in valleys than on hills, the relief of the present surface is considerably less than it would be if the bedrock were exposed everywhere.

GEOLOGY

Geologic History

The rocks underlying Chemung County may be divided into two principal types: (1) consolidated rocks (bedrock) and (2) unconsolidated deposits. The exposed bedrock consists of sandstone and shale of Devonian age. These rocks were deposited as sand and mud by rivers draining highlands to the east of the county. These ancient streams flowed into a shallow sea that occupied a trough extending southward to Tennessee and northwestward to the Pacific Ocean. Deposition of sediments continued in this trough until they accumulated to a thickness of several thousand feet. The weight of overlying sediments compacted the sand and mud into sandstone and shale. After the sea had receded from the area, erosion of the exposed rocks began. By the processes of erosion, which removed hundreds or possibly thousands of feet of sediments, the surface was dissected into a system of uplands and valleys.

Erosion of the bedrock was continuing when continental ice sheets thousands of feet thick invaded the area one or more times during the Pleistocene epoch. The advance of the ice sheets, which at the points of maximum growth covered the highest hills in the county, was preceded by the movement of tongues of ice down the larger valleys. As these tongues moved, they deepened and broadened the valleys. Although the ice sheets associated with the tongues eventually covered the uplands as well as the valleys, the thickness and rate of movement of the ice, and therefore the erosion of the bedrock were considerably less in the uplands than in the valleys.

The growth of the ice sheet ceased when wasting during the summers exceeded growth during the winters. This change in climatic conditions resulted in recession of the ice front. The recession was probably most rapid in the uplands, leaving the valleys choked with broken blocks of stagnant ice. As the ice on the uplands melted, the rock materials it had picked up during its advance were transported by meltwater streams into the adjoining valleys. This material was deposited either by streams flowing along the margins of the ice that choked the valleys or in stream channels on the ice. These deposits are termed "kame terraces" if they are flat-topped and "kames" if they are conical or irregular. The meltwater streams emerging from the ice in the valleys also were heavily laden with rock debris derived from the ice. As the flow of these streams decreased, their ability to transport materials was diminished, and the result was the deposition of sand and gravel in the channels. These meltwater deposits are known by the general term "outwash."

Prior to the last advance of the ice over the area, an extensive lake occupied the valleys to an altitude of about 1,100 feet. Clayey silt brought in by streams was deposited to a depth of several hundred feet in this lake. When the ice advanced the last time, streams carrying meltwater from the ice cut channels into the silt. As the ice front approached the area, these channels were filled with sand and gravel. When the ice overrode the area, it deposited an unsorted mixture of clay, silt, sand, and boulders termed "till" in an almost continuous layer. During the recession of the ice from the area, outwash sand and gravel was deposited on the till.

As the front of the last ice sheet receded northward from the area, an extensive lake, glacial Lake Newberry, was formed along the front. At one stage in the recession the entire discharge of this lake, which extended from the Genesee River to Skaneateles Lake, flowed southward through the glacial Horseheads River (Fairchild, 1909, p. 22, pls. 34, 35). This river flowed down the valleys now occupied by Catharine and Newtown Creeks. As a result of the large volume of water flowing out of Lake Newberry, the deposits along the course of the glacial Horseheads River were extensively reworked. These deposits adjacent to the present streams have been modified to some extent by erosion and deposition in Recent time also.

Consolidated Rocks

The bredrock that crops out or underlies the glacial drift in the county is of Devonian age and can be divided into the Portage and Chemung formations. As these formations are similar lithologically, and act essentially as one hydrologic unit they are discussed together in the following sections pertaining to the ground-water resources. However, in order to facilitate a comparison of the water-bearing formations in Chemung County with the same or equivalent formations in adjacent areas, a brief discussion of the individual formations composing the bedrock follows.

Portage Formation

The oldest rocks exposed in the county consist of interbedded shale and sandstone referred to the Portage formation (Williams, Tarr, and Kindle, 1909). This formation crops out in only a few small areas in some of the deeper valleys. Among these are (1) a relatively broad area extending from Horseheads northward to the county line, (2) a narrow belt about 3 miles long on the eastern side of the valley at Elmira, and (3) a small area in the vicinity of Van Etten. The formation is several hundred feet thick and can be divided into three members: Sherburne flagstone, Ithaca shale, and Enfield shale. Although all three members are present in the county, only the uppermost member, the Enfield shale, is represented in the outcrops. The Enfield is relatively unfossiliferous and consists of alternating beds of tough gray flaggy shale and thin hard tough flaggy sandstone.

Chemung Formation

The Chemung formation includes all the bedrock in the county above the Portage formation. It can be divided into two members, the Cayuta shale member at the bottom and the Wellsburg sandstone member at the top. The Cayuta shale member is more than 500 feet thick and consists of alternating layers of soft gray shale and fine-grained gray sandstone. The contact between the Cayuta shale member and the underlying Enfield member of the Portage formation is gradational. Thus, the lithologic characteristics that permit differentiation of the formations are not evident near the contact. However, their distinctive appearance on weathered surfaces permits differentiation in some areas. On weathering, the Cayuta tends to form blocky fragments, whereas the Enfield tends to form splintery fragments.

The Wellsburg sandstone member consists of more than 500 feet of interbedded sandy shale and fine-grained flaggy sandstone. In the southeastern part of the county the upper part of the member contains beds of pebble conglomerate up to 2 feet thick. The Chemung formation crops out at the surface on the upper part of some hills in the central and southern parts of the county.

Structure

The consolidated rocks in the county have been deformed at least twice. The first deformation consisted of a low regional dip to the south which was imparted to the strata by an uplift centered in Canada. Superimposed on this regional dip later was a series of low folds trending roughly east-west. The dip of the strata along the limbs of these folds exceeds 10° in places.

Joints—fractures in the bedrock—are among the most important structural features affecting the movement and storage of ground water in the bedrock. Two principal sets of joints cut the bedrock in Chemung County. One set strikes approximately north-south, and the other, approximately east-west. Both sets of joints have nearly vertical dips. However, joints of random orientation are common in some areas; for example, joints that deviate as much as 30° from the general strike are common in some areas of Elmira. Joints appear to be more prominent in the lower part of the exposed bedrock section than in the upper part.

Unconsolidated Deposits

Unconsolidated glacial drift overlies the bedrock almost everywhere in the county. Most of this drift was derived from local shale and sandstone, but some was eroded from rocks that crop out north of the county. The drift may be divided into two units, which constitute the end members of a continuous series (Flint, 1947, p. 103) grading from till, which was deposited beneath the ice and in which particles ranging in size from boulders to clay are mixed together, to well-sorted, stratified deposits in which the fragments have a much narrower range of grain size. The stratified deposits may be further divided into (1) silt and clay laid down in lakes or other standing bodies of water and (2) sand and gravel deposited in stream channels.

Differences in size of the constituent grains and the degree of sorting of the principal types of unconsolidated glacial deposits are shown graphically in figure 2. The analyses on which the graphs are based were supplied by the New York district office of the Corps of Engineers, U. S. Army. Samples 1 and 2 were collected between depths of 15 and 17 feet and 33 and 35 feet, respectively, in test hole DH 34 (see figs. 3 and 4). Sample 3 was collected between depths of 35 and 37 feet in test hole DH 43.

The graph for sample 1 shows the grain-size distribution of stream-laid sandy gravel. The rather abrupt changes in slope at the 80-percent and 20-percent lines apparently indicate that sample 1 is a composite of at least one layer of gravel and a part or all of one layer of sand.

The graph for sample 2 represents the grain-size distribution of till. As indicated by the graph, approximately 24 percent of the sample by weight exceeded a grain size of 2 millimeters, and approximately 62 percent by weight was smaller than 0.06 millimeter. The size of the constituent particles of the till ranged from about 50 millimeters to less than 0.0006 millimeter.

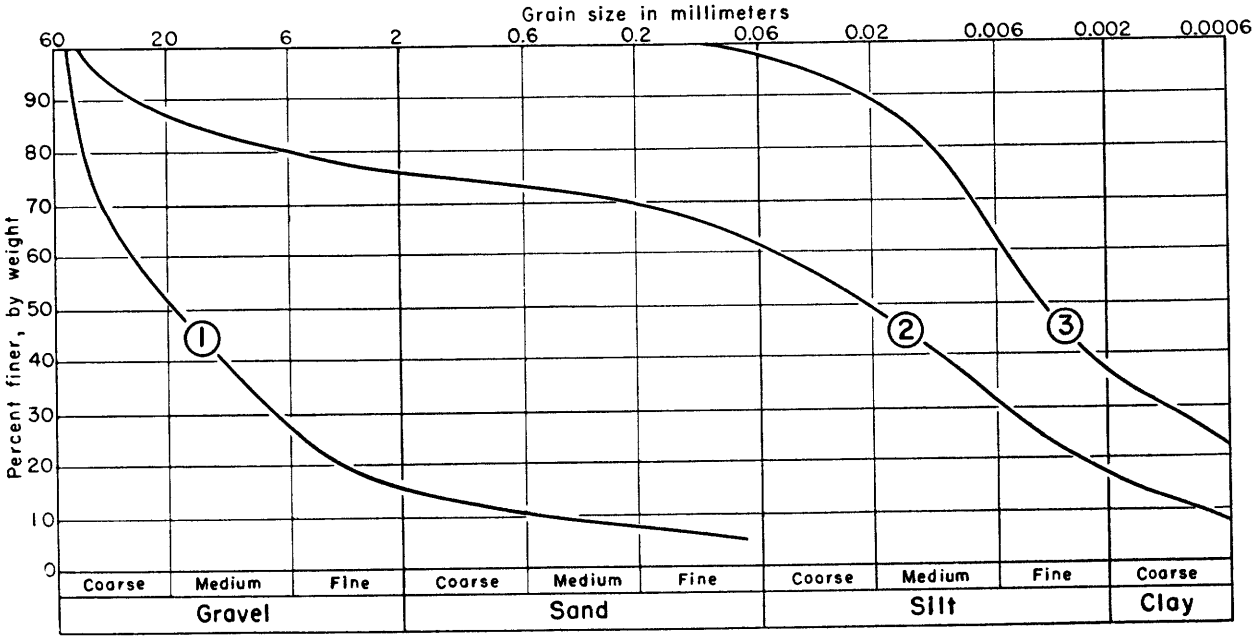


Figure 2.—Graph illustrating the range in size of the constituent grains of sandy gravel (1), till (2), and clayey silt (3).

The graph for sample 3 shows the grain-size distribution of the deposit of lacustrine clayey silt which underlies the major valley areas. The graph shows that only about 3 percent by weight of the grains composing the deposit are larger than 0.06 millimeter. About 22 percent of the deposit is finer than 0.0006 millimeter. Most of the stream-deposited sand and gravel consists of irregularly interbedded layers of sand and layers of fine to coarse gravel. Individual layers are generally only a few inches thick and are not continuous for more than a few hundred feet. The lacustrine deposits generally consist of alternate layers of silt and clay. The individual layers range from about a tenth of an inch to half an inch in thickness and each group of two layers—that is, one layer of silt and one layer of clay—represents an annual cycle of deposition.

Deposits in the Uplands

The till, which mantles most of the hills, ranges in thickness from less than 1 foot to more than 100 feet, and averages about 30 feet. The thickest deposits are found on hillsides and in small, rounded hills composed entirely of till, which may occur in any topographic situation.

Most of the till in the uplands was derived from the local bedrock. As this rock is composed largely of shale interbedded with thin layers of sandstone, the till consists predominantly of clay and small amounts of silt and sand. Intermixed in the fine-grained matrix of clay, silt, and sand are many large fragments of sandstone, limestone, and other resistant rocks. Small lenses and irregular bodies of water-sorted sand and gravel are distributed through the till.

Deposits in the Valleys

The floors of most valleys in the county are underlain by stratified drift ranging in thickness from a few feet, at the heads of small tributary valleys, to several hundred feet in the major valleys. Stratified

drift consists of two distinct types: (1) sand and gravel deposited by meltwater streams flowing from the ice, and (2) clayey silt deposited in extensive lakes which covered parts of the area during Pleistocene time. In parts of the valleys the stratified deposits are interbedded with, or overlain by, a thin layer of till.

The unconsolidated deposits in the valleys are layered in a more or less regular sequence. The oldest deposits consist of sand and gravel in the deepest parts of the larger valleys. These deposits are overlain by a relatively thick section of blue clayey lacustrine silt. Where the older sand and gravel are absent, the silt lies directly on bedrock. The silt is exposed at the surface in a few small areas in the major valleys. More commonly, however, it is overlain either by younger stratified sand and gravel or by till. The younger sand and gravel fills broad channels in the silt. The depth of these channels and the thickness of the younger sand and gravel exceed 100 feet in places.

Although the unconsolidated deposits in the valleys follow a regular sequence, the areal extent and thickness of the several types of deposits range greatly within any valley. In order to facilitate the description of the deposits in the following sections, segments of the major valleys and the larger tributary valleys are discussed separately.

Elmira–Horseheads valley.—Most of the population and industry in the county are concentrated in the broad valley that extends southward from Catharine Creek, north of Horseheads, to Seely Creek, south of Elmira. This valley ranges in width from about 1.5 miles near Horseheads to 2.5 miles near Seely Creek. The sides of the valley between Elmira and Horseheads are bordered by terraces which are about 0.1 mile wide on the east side of the valley and 0.1 mile to more than 0.5 mile wide on the west. These terraces range in altitude from 900 to 1,000 feet. The terrace in the northwestern part of Elmira has been modified by the coalescing alluvial fans of Heller Creek and Hoffman Brook. The valley floor below the terraces is relatively flat and slopes gently toward the south and toward Newtown Creek, which flows along the east side of the valley.

The valley is underlain by stratified deposits ranging in thickness from about 30 feet in parts of Elmira Heights to more than 400 feet in a narrow channel cut into the relatively flat bedrock floor of the valley. Logs of the few deep wells in the area show that the deposits in the deepest part of the channel consist largely of gravel. This gravel and most of the bedrock floor of the valley are overlain by a thick section of clayey silt. The silt, in turn, is overlain in most places on the valley floor by younger stratified sand and gravel. In the terraces along the sides of the valley the silt is overlain in most places by till. Where the till is absent, as on part of the terrace along the west side of the valley, the silt crops out at the surface. Near the valley wall in the eastern part of Elmira and near the center of the valley at Elmira Heights, the silt has been removed by erosion and younger gravel lies directly on bedrock.

The unconsolidated deposits penetrated by wells and test holes along the Chemung River in the vicinity of Elmira are shown in sections A-A′ and B-B′ of figure 3. The locations of these sections and other wells and test holes in the Elmira-Horseheads valley, for which logs are given in table 3, are shown in figure 4. As may be seen from figure 3, most of the upper part of the deposits consists of sand and gravel. Although most of the wells and test holes ended in sand and gravel, wells Cm 594 and Cm 22 and test holes DH 8, DH 16, DH 36, DH 43, DH 49, and NY 11 ended in clayey silt. The surface of the silt is irregular, as may be observed in the sections of figure 3. In section A-A′, well Cm 594 penetrated silt at an altitude of 798 feet above sea level, whereas test hole DH 16, 1,500 feet to the east, penetrated silt at an altitude of 827 feet, or 29 feet higher. Test hole NY 11 penetrated till from the surface to a depth of about 34 feet, where it entered silt.

Except for the valley of the Chemung River west of Elmira, which is discussed in a following section of the report, the largest valleys tributary to the Elmira-Horseheads valley are those of Newtown Creek, Seely Creek, Hoffman Brook, and Latta Brook. The valleys of Newtown Creek and Seely Creek contain extensive deposits of sand and a few deposits of sandy gravel. The south side of the valley of Seely Creek, from Pine City to the village of Seely Creek, is underlain by a thick section of sand and gravel which was deposited as kames. The valley of South Creek, a tributary of Seely Creek, also contains marginal deposits of sand and gravel, laid down as kame terraces. The valley of Hoffman Brook contains a thick section of unconsolidated deposits consisting principally of sand and gravel. Borings at the dam of the Hoffman Brook Reservoir penetrated about 10 feet of sand and gravel near the south side of the

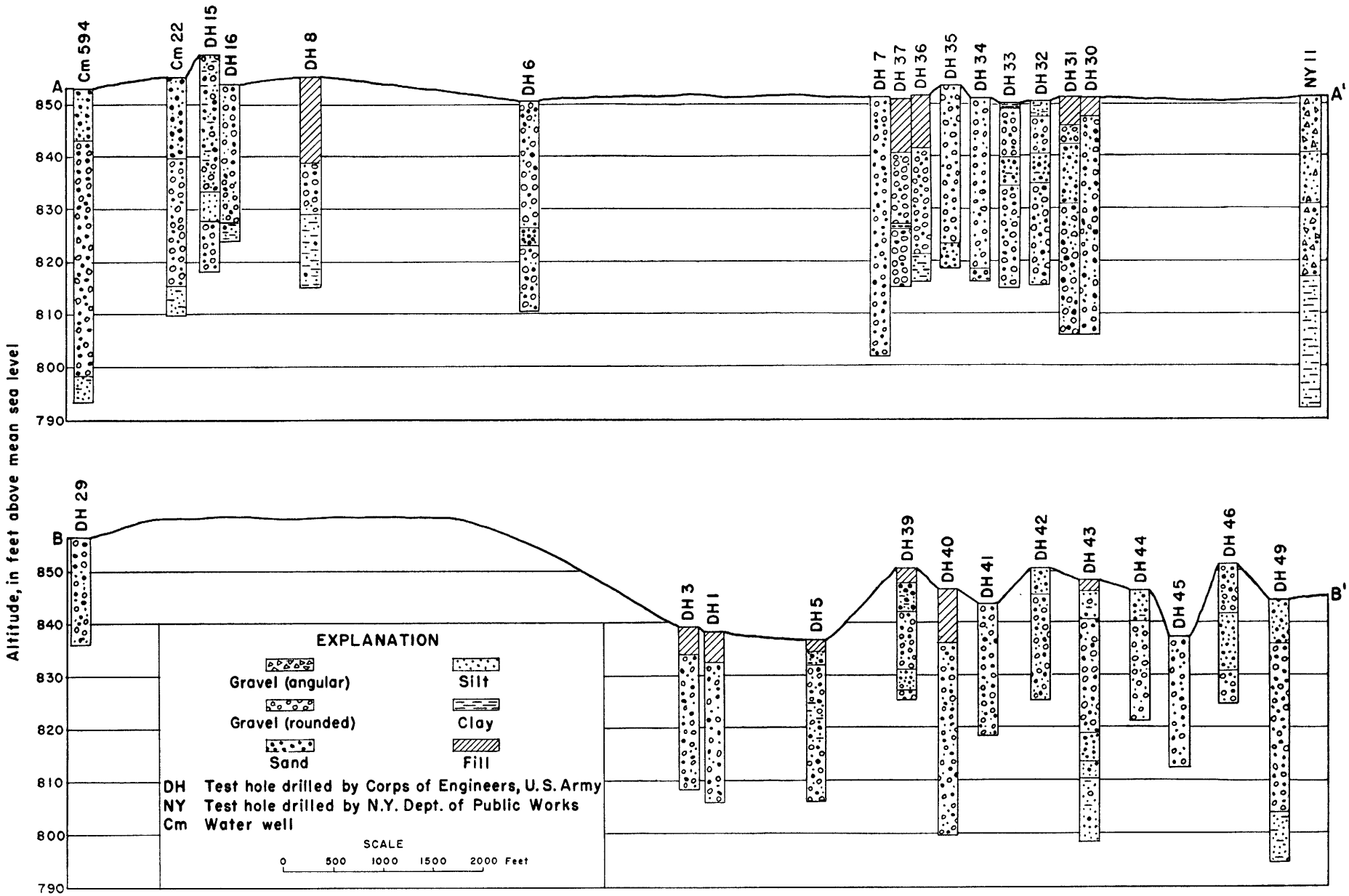


Figure 3.—Sections showing the unconsolidated deposits along the Chemung River in the southern part of Elmira. (For locations of sections see fig. 4.)

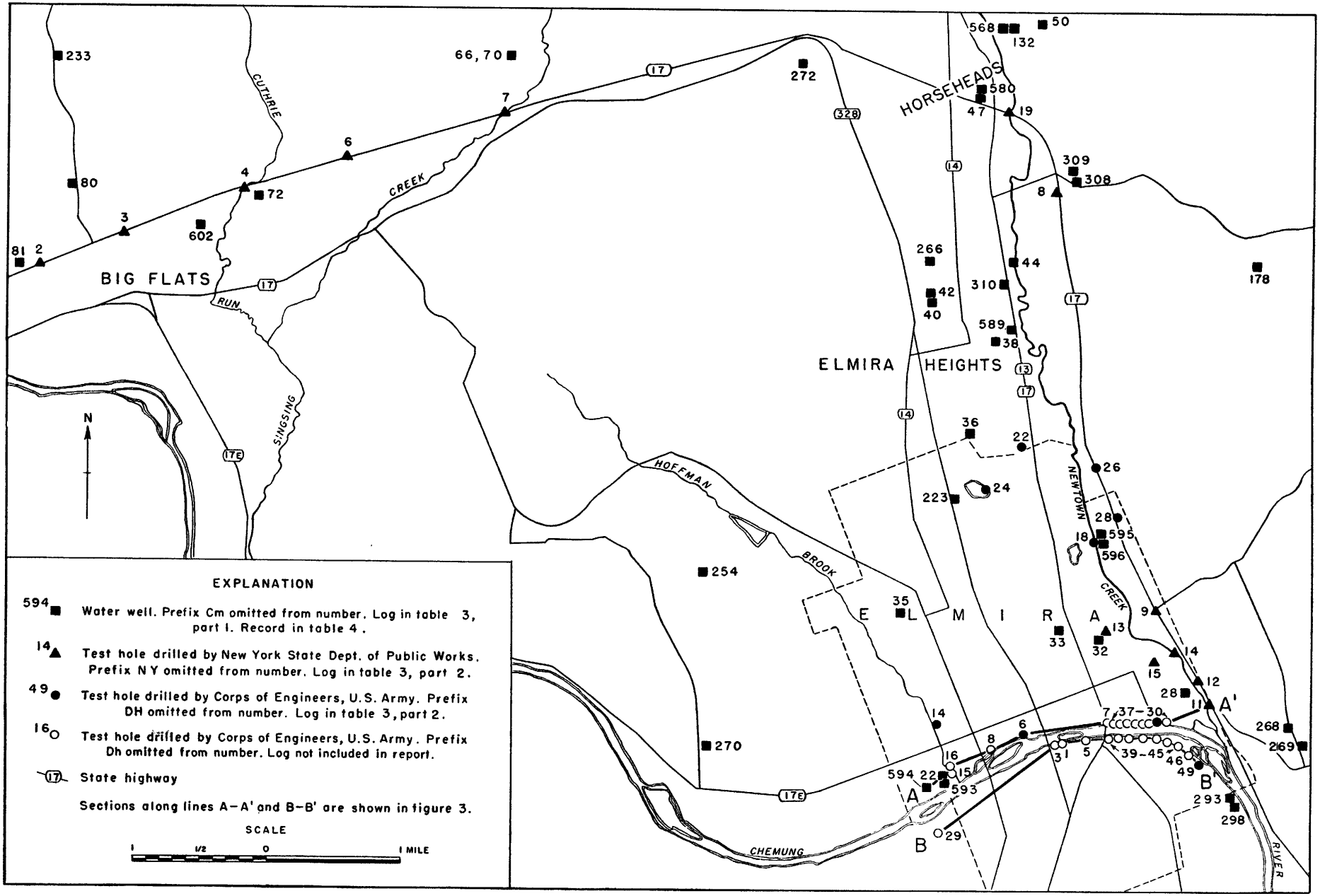

BIG FLATS
ELMIRA HEIGHTS
HORSEHEADS
CUTHRIE
CREEK
RUN
SINGSING
HOFFMAN
BROOK
NEWTOWN
CREEK
CHEMUNG
RIVER
N
EXPLANATION
594 Water well. Prefix Cm omitted from number. Log in table 3, part 1. Record in table 4.
14 Test hole drilled by New York State Dept. of Public Works. Prefix NY omitted from number. Log in table 3, part 2.
49 Test hole drilled by Corps of Engineers, U.S. Army. Prefix DH omitted from number. Log in table 3, part 2.
16 Test hole drilled by Corps of Engineers, U.S. Army. Prefix Dh omitted from number. Log not included in report.
17 State highway
Sections along lines A–A' and B–B' are shown in figure 3.
SCALE
1 1/2 0 1 MILE

Figure 4.—Map of the Elmira area showing the location of selected water wells and test holes.

valley and about 90 feet of sand and gravel and 10 feet of clay near the north side. Stratified deposits are not as extensive in the valley of Latta Brook as in other valleys in the Elmira-Horseheads area. However, more than 50 feet of stratified deposits and till are present in places at the sides of the valley.

Horseheads-Big Flats valley.—The valley extending westward from Horseheads to the Steuben County line and beyond is a continuation of the Elmira-Horseheads valley. This valley is about 1.5 miles wide and 7 miles long in Chemung County. Extensive alluvial fans built along the north side of the valley by Singsing Creek, Cuthrie Run, and other small streams give the surface a gentle southward slope. Between Big Flats and Horseheads several hills rise above the general level of the valley.

Only a few wells are known to penetrate to bedrock in this area. As a result, little is known about the thickness of the unconsolidated deposits and the configuration of the bedrock floor of the valley. The available data indicate that the unconsolidated deposits range in thickness from about 25 feet near the south side of the valley to more than 75 feet in the central and northern parts. The locations of those wells and test holes for which logs are included in table 3 are shown in figure 4.

The sequence of unconsolidated deposits in this area is somewhat different from the sequence in other valleys. The lowest known deposits consist of blue clayey silt which is probably equivalent to similar deposits in the other valley areas. The silt, except where it crops out at the surface, is overlain by two beds of sand and gravel separated by a bed of silt and clay as much as 25 feet thick. The lower bed of sand and gravel is generally less than 20 feet thick, but the upper one is locally more than 50 feet thick and is exposed in large parts of the valley. The thickest sections of gravel penetrated by wells are in alluvial fans along the north side of the valley.

The small hills in the valley between Big Flats and Horseheads consist of clayey silt overlain by till. The clayey silt, thinly veneered by sand and gravel, also underlies a relatively large area in the vicinity of Big Flats. This silt is similar lithologically to the bed of silt that directly overlies bedrock in most parts of the valley, and is considered to be remnants of this bed. However, this clayey silt may be related to the bed of silt and clay that separates the beds of sand and gravel.

Big Flats-Elmira valley.—From Big Flats to Elmira the Chemung River follows a canyon 7 miles long, half a mile wide in its center section and about a mile wide at either end. The western part of the canyon from Big Flats to the confluence of the Chemung River and Singsing Creek is nearly flat. The sequence of the deposits underlying this section of the canyon is similar to that of the Horseheads-Big Flats valley. Immediately east of the confluence with Singsing Creek the river is deflected against the south wall of the canyon by a fan-shaped mass of unconsolidated deposits consisting principally of till. Well Cm 509, near the center of the area, reportedly obtains water from gravel at a depth of 104 feet. Well Cm 510, about 0.1 mile to the north, reportedly penetrated 226 feet of unconsolidated deposits before entering bedrock. This well obtains water from bedrock and, because of its relatively great depth, it appears likely that little or no sand or gravel was penetrated.

About a mile to the east, the Chemung River is deflected to the north side of the canyon by another fan-shaped mass of unconsolidated sediments, which was deposited in part by Hendy Creek. Sand and gravel more than 40 feet thick underlie parts of this area.

At Fitch Bridge the Chemung River again crosses the canyon and flows along the south wall opposite a continuation of the terrace that borders the west side of the Elmira-Horseheads valley. Although till or silt lies at the surface in most places on this terrace, sand and gravel lie at the surface in parts of it adjacent to the Chemung River and for a considerable distance upslope.

Lower Chemung River valley.—The valley of the Chemung River, from its confluence with Seely Creek to the southeastern corner of the county, is about 1 mile wide and 12 miles long. The river has developed multiple channels through much of this valley area, which give it a braided appearance. The floor of the valley is a flood plain which slopes from an altitude of about 830 feet near Seely Creek to about 780 feet at the southeastern corner of the county. North of Wellsburg, two long, narrow ridges of glacial drift (eskers) rise as much as 60 feet above the flood plain. Other eskers border the north side of the valley east of Lowman and east of Chemung and the south side of the valley west of Chemung.

Insofar as is known, no wells on the flood plain penetrate bedrock in the lower Chemung River valley. Thus, the depth to bedrock and the configuration of the bedrock floor of the valley are not known.

That the valley is underlain, at least in part, by a relatively thick section of unconsolidated deposits is shown by the record of well Cm 3, 1 mile west of the village of Chemung. This well was drilled to a depth of 173 feet without reaching bedrock. The deepest known unconsolidated deposit in the valley consists of gravel, which was penetrated by well Cm 3 at a depth of 172 feet. This gravel is overlain, in ascending order, by clayey silt and till. Records of the material penetrated by wells in other parts of the valley indicate that the silt is relatively continuous. The till is not continuous, however, for in most parts of the flood plain the silt is overlain by more than 50 feet of sand and gravel. Kames are present along both sides of the valley east of Lowman. These kames, which rest either directly on bedrock or on the layer of silt, are composed of sand and gravel and of till.

Valleys tributary to the lower Chemung River valley include those of Baldwin Creek, Wyncoop Creek, and Bentley Creek. The unconsolidated deposits in these valleys are as much as 50 feet thick and consist of clayey silt, sand, gravel, and till. The sand and gravel is restricted principally to the valley bottoms, though some occurs as kames on the sides of the valleys. In the lower reaches of these valleys the sand and gravel and the till are generally underlain by clayey silt.

Post Creek valley.—Post Creek enters Chemung County near its northwest corner and flows southward in a narrow valley about 0.5 mile wide for a distance of about 4 miles before turning west into Steuben County. Sand and gravel is restricted principally to the central part of the valley, where it is overlain by till and clay as much as 30 feet thick. Till lies at the surface in places at the sides of the valley.

Catharine Creek valley.—Catharine Creek heads about 8 miles north of Horseheads and flows in a southerly direction for approximately 6 miles, where it turns to flow in a westerly direction across the north end of the Elmira-Horseheads valley. Northwest of Horseheads the creek changes course to a northerly direction and flows along the west side of a broad, poorly-defined valley. The unconsolidated deposits in this valley consist of till, up to 100 feet thick, and of sand and gravel overlying silt. South of Johnson Hollow the flood plain of the creek is underlain by sand and gravel.

Cayuta Creek valley.—Cayuta Creek flows in a valley about 0.5 mile wide which extends diagonally across the northeast corner of the county. Deposits of sand and gravel underlie parts of the valley floor. The remainder of the valley floor and the side slopes of the valley are underlain by till.

GROUND WATER

Ground water is the part of the subsurface water that is in the zone of saturation—the zone in which all pore spaces are filled with water under hydrostatic pressure. This zone is the reservoir from which water from wells and springs is derived. The upper surface of the zone of saturation is known as the "water table." A layer or other body of rock in the zone of saturation that will transmit water in usable quantities to wells or springs is termed an "aquifer."

Ground water in Chemung County is derived from local precipitation. Only a part of the precipitation, however, reaches the zone of saturation. The remainder runs off from the land surface or is returned to the atmosphere, either by evaporation or by the transpiration of plants. The amount of precipitation that becomes ground water depends principally on the intensity of the precipitation, the slope of the land, the amount and type of vegetal cover, and the character of the surface and subsurface material through which the water must percolate to reach the zone of saturation. Thus, rain falling at a slow, steady rate on flat, permeable ground will result in more infiltration than rain falling at a rapid rate on steep, relatively impermeable ground. After water reaches the zone of saturation it flows under the influence of gravity toward a point of discharge, such as a spring or stream.

The ground water thus moving toward a point of discharge may be either water-table (nonartesian, unconfined) or artesian (confined) conditions. Where the water table is free to rise and fall in a permeable formation, the ground water is said to be under water-table conditions. Where the water completely fills a permeable bed that is overlain by a relatively impermeable, confining bed, it is said to be under artesian, or confined, conditions. Strictly, the term "artesian" is applied to any ground water that is under sufficient pressure to rise above the bottom of the confining bed, but not necessarily above the land surface.

Ground water may be obtained in usable quantities in nearly all parts of Chemung County either from the unconsolidated surficial deposits or from the bedrock. Data on the construction, yield, and other features of wells drawing from the various water-bearing deposits of the county are contained in table 4. The locations of the wells listed in the table are shown on plate 1.

The perennial yield of the water-bearing deposits depends, among other factors, on the amount of recharge. Thus, the source and the conditions governing the recharge to the water-bearing deposits are important in the development of ground-water supplies. In the uplands, the only source of recharge is the precipitation that falls on the immediate vicinity. In the valleys, however, recharge is derived not only from local precipitation but also from underflow and surface flow of water from upland areas.

In the uplands, the steeply sloping surface, together with the low permeability of the surficial deposits, results in the runoff of a large part of the precipitation. The relatively small quantity that reaches the zone of saturation moves down the slope of the water table toward points of discharge. As the water table stands at a higher altitude beneath hills than in valleys, the slope of the water table and, therefore, the direction of ground-water movement are toward the adjoining valley areas.

Considerable recharge occurs where streams draining the uplands flow across permeable deposits in the valleys. In fact, the entire flow of many small streams percolates into the ground except in periods of high flow. The water table is generally highest at the margins of the valleys and slopes toward the streams draining the valleys as well as downvalley.

Water-Level Fluctuations

The amount of water stored in the ground at any time depends on the balance between recharge and discharge and is indicated by changes in water levels in wells. A decline in water level shows a decrease in stored water, due to discharge alone or to discharge in excess of recharge. A rise in water level shows an increase in stored water, due to recharge in excess of discharge. In order to determine the extent to which water levels in Chemung County fluctuate in response to changes in recharge and discharge, weekly measurements of water levels in well Cm 83 were begun in 1946 and in well Cm 84 in 1947. Figure 5 contains hydrographs showing the fluctuations of the water level in these wells. Well Cm 83, which is 21 feet deep, reportedly penetrates gravel beneath till. It is located at an altitude of about 1,450 feet in the uplands east of Elmira. Thus, fluctuations of the water level in the well are believed to be indicative of fluctuations of the water table in the uplands. Well Cm 84, in the southern part of Elmira, is 257 feet deep. Although the casing in this well is of unknown length, it probably extends through the clayey silt which generally underlies the surficial sand and gravel. It is probable that the well penetrates either bedrock or gravel which directly overlies bedrock.

As may be seen from the hydrographs in figure 5, ground-water levels are generally highest in the early spring and lowest in the fall. They begin to rise in the late fall or early winter, when the transpiration of plants and evaporation losses are reduced, and remain relatively high until late spring, when plant growth resumes and warm weather increases the rate of evaporation. As transpiration and evaporation rates continue to increase, the recharge reaching the zone of saturation is decreased and water levels begin to decline. This decline continues until the arrival of cold weather in the fall reduces the rate of evaporation and transpiration and precipitation replenishes the depleted soil moisture. Figure 5 shows that the water level in well Cm 83, in the uplands, fluctuates through a much greater range than the water level in well Cm 84, in the valley at Elmira.

Table 4 shows the depth to water level, in feet below land-surface datum, in most of the wells for which records are available in Chemung County. Only about 10 percent of these measurements were made by the U. S. Geological Survey. The remainder were reported by the drillers or owners of the wells. Most of the measurements by the Geological Survey were made after the wells had remained idle for several hours or longer and therefore are representative of static (nonpumping) levels. Some of the reported measurements, on the other hand, were made while the wells were being drilled or soon after the wells had been pumped, and thus may differ considerably from the static level.

The measurements listed in table 4 show that the depth to water below the land surface in the valleys ranges from less than 5 feet to about 25 feet and is generally about 15 feet. The depth to water in the uplands ranges much more widely. In till the water level generally ranges from about 5 feet to

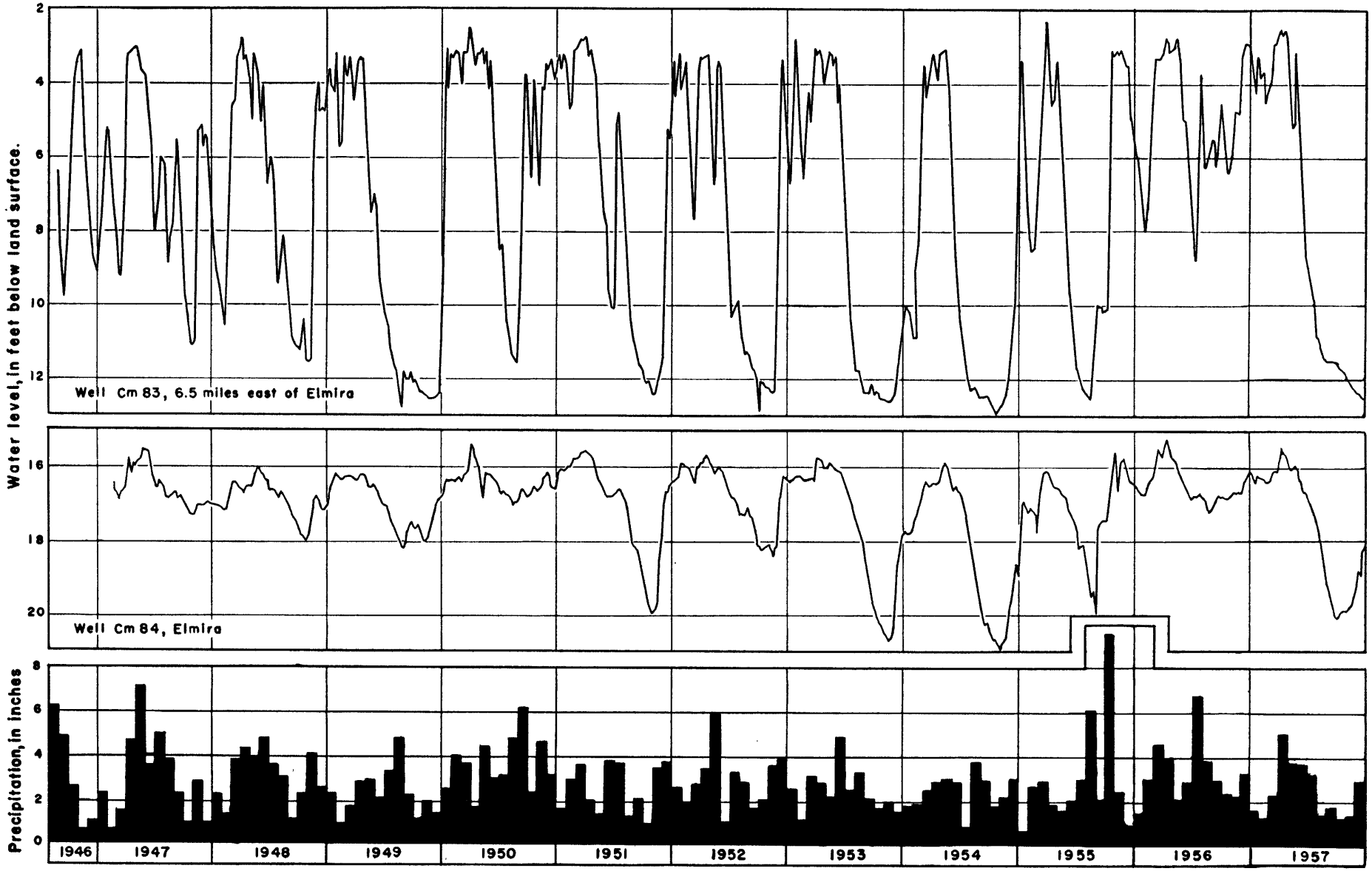


Figure 5.—Hydrographs of wells Cm 83 and Cm 84 and monthly precipitation at Elmira.

more than 25 feet below the land surface. In bedrock it ranges from less than 5 feet on steep slopes to about 100 feet on the tops of hills where till retards the downward percolation of water to the bedrock and thus prevents the water table from building up very high.

Occurrence of Water

Consolidated Rocks

Approximately 60 percent of the wells in the county obtain water from bedrock. Of these, more than 95 percent draw from the shallowest bedrock formation, the Chemung. Most wells that tap bedrock are located in the uplands, where the unconsolidated deposits are generally thin and relatively impermeable.

Ground water in bedrock occurs principally in joints, along bedding planes, and in other openings such as small pores in sandstone. Of these, the joints and bedding-plane openings are most important from a hydrologic standpoint. The joints are in two principal sets, one striking about north-south and the other about east-west. Both sets are vertical, or almost vertical, and hence intersect at approximately right angles. The spacing of the joints ranges from a few inches to a few feet. Their intersections form vertical ducts through which water moves downward from the surface, or from the overlying unconsolidated deposits. Joints at or near the land surface may be enlarged by weathering to as much as an inch in width, but these enlarged openings are generally filled with silt and clay. The width of joints decreases with depth, and below a few hundred feet they are practically closed. Connections between joints are provided also by horizontal, or nearly horizontal, openings which develop principally along bedding planes between the shale and sandstone beds. As these beds are generally less than 4 inches thick, the horizontal openings are relatively close together. Bedding-plane openings in sandstone, as a rule, are more widely spaced and more continuous than those in shale. Intergranular spaces (pores) and faults, though present in parts of the bedrock, probably do not contribute appreciably to its water-storing and water-transmitting capacity.

The water-transmitting capacity of the bedrock in Chemung County depends on the size, shape, abundance, and interconnection of the joints and other openings, particularly open bedding planes. The yield of an individual well depends, among other factors, on the number of openings intersected by the well. Because the distribution of joints is irregular, the yields of adjacent wells may be greatly different.

The average yield of wells tapping bedrock in the county is about 8 gpm. The range in yield is from less than 1 gpm to about 200 gpm. About a quarter of the wells yield less than 5 gpm and another quarter, more than 12 gpm. The average depth of wells drawing water from bedrock is about 100 feet, the range being from 8 to 500 feet.

Unconsolidated Deposits

Approximately 40 percent of the wells in Chemung County obtain water from unconsolidated deposits. All wells that produce large quantities of water draw from these deposits. Water in these deposits occupies the pore spaces between the constituent grains. The quantity of water that may be stored depends on the porosity of the material—the percentage of the total volume of the deposit that is occupied by voids—or, more strictly, on the porosity that is provided by interconnected voids. On the other hand, the permeability—the rate at which it will transmit water—depends on the size, shape, and interconnection of the pores. The unconsolidated deposits in Chemung County range widely in their ability to store and to transmit water. The porosity of till and silt is generally comparable to or even higher than that of sand and gravel. However, because the pore spaces in sand and gravel are much larger, they transmit water many times as rapidly as those in till or silt.

Ground water occurs in the unconsolidated deposits under both water-table and artesian conditions, but water-table conditions are much more common. In till, water generally occurs under water-table conditions. Such conditions are common also in sand and gravel that directly underlies the surface. Where the water-bearing materials are overlain by less permeable deposits, water generally occurs under artesian conditions. Sand and gravel are the most permeable water-bearing materials in the county, and artesian conditions commonly exist where the sand and gravel are overlain by silt or till.

Figure 6 is a generalized map of the county showing the extent and water-yielding capacity of the most permeable unconsolidated deposits in each area. As may be seen from the map, the most permeable

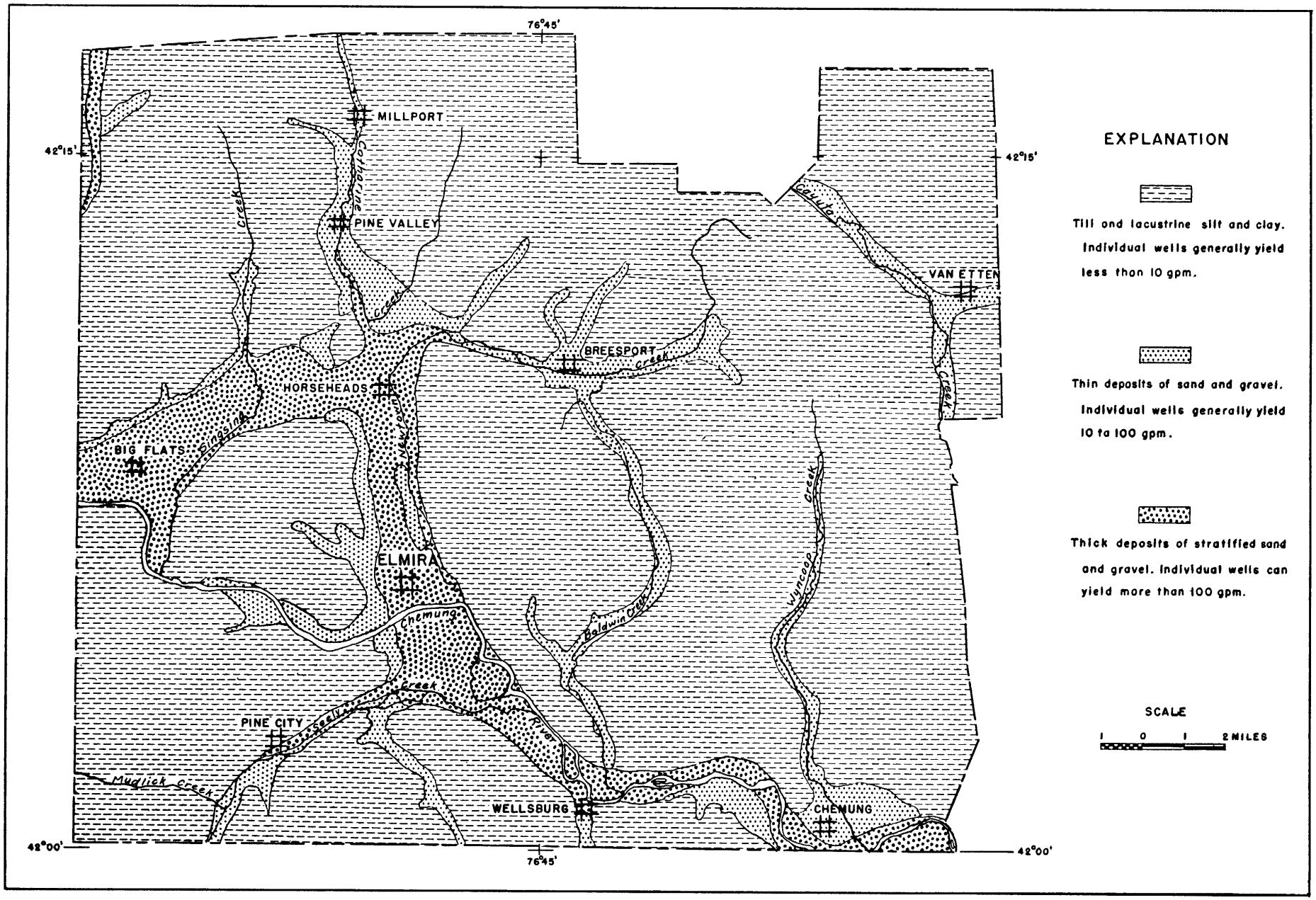


Figure 6.—Map of Chemung County showing yield of the unconsolidated deposits. In parts of the valley areas the deposits shown on the map are overlain by less permeable deposits.

deposits in the valley areas consist of sand and gravel. In some areas, as in parts of the Elmira-Horseheads valley, these deposits directly underlie the surface. In other areas, as in the Newtown Creek valley east of Breesport, they are overlain by relatively impermeable deposits of till.

Sand and gravel.—Deposits of stratified sand and gravel underlie large areas in the major valleys and smaller areas near the streams in some of the smaller valleys. In addition, sand and gravel deposited as kames borders the valleys in many places. All these deposits are capable of yielding moderate to large quantities of water to wells.

Most existing wells drawing from sand and gravel yield less than 50 gpm, but these are not indicative of the potential yields. Many of the wells draw water only through the open end of the casing because only small supplies are needed. Where large quantities of water are needed, the lower part of the casing is perforated or the wells are equipped with screens. Several such wells, used for industrial supply in the Elmira-Horseheads valley, draw as much as 1,000 gpm from sand and gravel with drawdowns of less than 10 feet.

As previously indicated, the water-bearing deposits in the valleys are recharged from local precipitation, by ground water moving from the uplands, and by infiltration from many of the small streams draining the uplands. Thus, the natural recharge reaching the sand and gravel deposits in the valleys is relatively large. Under natural conditions, the water in these deposits moves down the hydraulic gradient and discharges into the major streams, such as the Chemung River.

The withdrawal of water from a well is accompanied by a lowering of the ground-water level in the vicinity of the well. The decline in water level is greatest at the pumped well and progressively less with increasing distance from the pumped well. As pumping continues the cone of depression deepens and broadens at a gradually diminishing rate. If the cone of depression extends to a stream into which ground water is being naturally discharged, the discharge will decrease or cease near the point of intersection and water from the stream will move into the aquifer. As the Chemung River, Newtown Creek, and other streams in the county flow over sand and gravel deposits in some areas, large withdrawals from wells near these streams would induce water to move from the streams into the deposits. Where the conditions for such induced recharge are particularly favorable, large withdrawals can be sustained for long periods without excessive lowering of water levels in wells.

Till.—Till is the most widespread unconsolidated deposit in the county. Because of its low permeability, water supplies adequate for domestic and other small needs can be obtained from till only by means of large-diameter wells which provide a large area for infiltration and a large volume for storage. Many of these wells are dug with hand tools. The depth of wells drawing from till ranges from about 5 feet to more than 50 feet and the diameter ranges from about 2 feet to more than 10 feet. The yield of dug wells is generally not known because pumps are operated only for short periods and draw water mostly from storage in the well. Where such wells penetrate sand lenses they may yield as much as 5 gpm, but yields of only a few hundred gallons per day are much more common.

Silt and clay.—In a few lowland areas in the county, such as parts of the valley of Catharine Creek, the unconsolidated deposits consist entirely of clayey silt. In a few places, where the depth to bedrock is relatively great and the cost of construction of bedrock wells is prohibitive, water supplies are obtained from the coarser silt. The yield of such wells, even those of large diameter, is inadequate for all except limited domestic or agricultural use. In most parts of the county, the silt and clay act as confining beds, retarding the upward movement of water from the underlying bedrock or more permeable unconsolidated deposits, rather than as an aquifer.

Utilization of Water

All water supplies in Chemung County, with the exception of the Elmira municipal supply, are obtained from ground-water sources. The total consumption of ground water in the county is estimated to exceed 15 mgd (million gallons per day). Approximately 9 mgd is used by industries, mostly for cooling but also for processing and plant service. The next largest use, about 2.5 mgd, is for domestic and farm supplies. The use of water for commercial purposes, principally for air conditioning, exceeds 2.25 mgd. Three public-water systems in the county, serving a population of about 5,000, are supplied by ground water. Horseheads obtains about 1 mgd from wells Cm 132 and Cm 568. Wellsburg obtains about 0.1 mgd from 4 wells; 2 of these, wells Cm 9 and Cm 10, are listed in table 4. The Beaver Valley development near Chambers, obtains about 200,000 gpd from well Cm 588.

Quality of Water

Analyses showing the chemical composition of 56 samples of ground water from Chemung County are listed in table 1. Part 1 of the table contains 33 analyses made by the Quality of Water Laboratory of the U. S. Geological Survey, Albany, and part 2 contains 23 analyses made by the New York State Department of Health, Albany. All results except those for specific conductance, pH, color, and temperature are expressed in ppm (parts per million). Thus, an iron content of 1 ppm is equivalent to 1 pound of iron dissolved in a million pounds of water (120,000 gallons).

The acceptability of ground water for certain uses depends on the kinds and concentrations of dissolved mineral constituents, the hardness, and the temperature. The U. S. Public Health Service has established standards for drinking water used on interstate carriers. A comparison of these standards with the quality of ground water in Chemung County is shown in table 2.

Mineral Constituents

Water percolating through the ground dissolves small quantities of the materials with which it comes in contact. The kind and concentration of the dissolved mineral constituents depend on (1) the composition and thickness of the soil and rock through which the water passes, and (2) the length of time the water is in contact with the earth materials. Thus, in general, deep wells are more likely to yield highly mineralized water than shallow wells, and wells in discharge areas are more likely to yield highly mineralized water than wells in recharge areas. The analyses listed in table 1 do not show any consistent differences between water from the unconsolidated deposits and water from the bedrock. This may be due to the fact that the unconsolidated deposits were derived largely from the local bedrock.

Iron differs from most of the other chemical constituents normally found in ground water in that small concentrations, more than about 0.3 ppm, will impart a metallic taste and will cause staining of clothing, fixtures, and utensils. Approximately 30 percent of the water samples analyzed contained more than 0.3 ppm of iron. The range in iron content of all samples was from 0.01 to 4.5 ppm.

The chloride content of ground water in most parts of Chemung County is less than 10 ppm. However, in a few areas wells yield water containing more than 100 ppm of chloride. These areas include (1) most of the Newtown Creek valley west of Horseheads, (2) parts of the east side of the Chemung River valley between Elmira and Lowman, (3) the Seely Creek valley in the vicinity of Pine City, and (4) the lower part of the Hendy Creek valley.

The source of the relatively high concentrations of chloride in the water of these areas is not known. The chloride may be derived from any of several sources, the most likely of which is salty water in the formations underlying the Portage. Data obtained during the construction of deep gas prospect wells have shown that the rocks underlying the Portage formation contains water nearly as salty as sea water. Thus, the relatively high concentration of chloride in the ground water in the areas described above may be due to contamination by the upward leakage of salty water along faults or possibly through the uncased portions of gas prospect holes. So far as known, no beds containing salt have been penetrated by water wells, and it appears unlikely that such beds exist in either the Portage and Chemung formations or the unconsolidated deposits.

Hardness

Hardness is the characteristic of water that generally receives the most attention in the domestic and industrial use of water. Hard water is recognized by the increased quantity of soap required to produce a lather, and by the insoluble mineral scale that is deposited in boilers and kettles when such water is heated or evaporated. Carbonate hardness, that hardness due to the bicarbonates of calcium, magnesium, and minor hardness formers, may be removed almost completely by boiling. Noncarbonate hardness, that hardness caused by other compounds of the hardness formers, such as chlorides and sulfates, cannot be removed by boiling.

Water having a hardness of less than 60 ppm, expressed as $CaCO_3$, is considered soft. About 10 percent of the samples in the county are so classified. A hardness of 60 to 120 ppm does not seriously interfere with the use of water for most purposes, although the consumption of soap is increased somewhat. Water having a hardness of more than 120 ppm is rated as hard and is commo nly softened when

Table 1.—Chemical analyses of water from wells in Chemung County.

Part 1: Analyses by U. S. Geological Survey.

(Chemical constituents in parts per million)

Well number	Depth (ft)	Water-bearing formation	Date of collection	Temperature (°F)	Silica (SiO_2)	Iron (Fe)	Manganese (Mn)	Zinc (Zn)	Lithium (Li)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Color
Cm 27	60	Pleistocene gravel	8-29-53	52	9.2	0.09	0.07	0.00	1.0	91	16	14	4.7	268	78	24	0.0	4.5	397	293	74	622	7.2	5
Cm 81	38	do.	4-18-56	44	....	.01	....	....	....	....	....	....	....	78	....	2.3	....	....	....	[b]81	17	170	7.6	..
Cm 86	40	do.	4-18-56	51	....	.09	....	....	....	....	....	....	....	168	....	2.2	....	....	....	[b]117	0	263	7.8	..
Cm 93	50	Chemung formation	8-29-53	52	8.8	.76	.07	.42	.3	40	13	8.2	.7	166	34	1.8	.1	2.1	199	[a]154	18	330	7.0	3
Cm 121	85	do.	4-18-56	47	....	.20	....	....	....	....	....	....	....	170	....	.9	....	....	....	[b]145	6	295	7.9	..
Cm 122	8	Pleistocene deposits	6-13-56	51	8.0	.10	.02	....	....	42	7.0	6.2	1.0	155	18	3.0	.1	2.1	165	[a]134	7	294	7.5	7
Cm 132	51	Pleistocene gravel	6-14-56	50	6.7	.03	.02	....	....	57	13	4.3	1.4	196	32	6.8	.1	4.8	248	[a]196	35	405	7.7	6
Cm 155	189	Portage formation	4-17-56	49	....	.17	....	....	....	....	....	....	....	374	....	9.6	....	....	....	[b]353	47	668	8.0	..
Cm 185	45	Pleistocene gravel	8-29-53	54	7.8	.03	.02	.00	.2	39	5.6	3.4	1.0	119	24	1.9	.0	5.0	161	120	23	261	7.6	5
Cm 190	96	Chemung formation	4-18-56	46	....	.14	....	....	....	....	....	....	....	77	....	2.9	....	....	....	[b]88	25	201	7.6	..
Cm 194	93	do.	4-18-56	50	....	.59	....	....	....	....	....	....	....	307	....	1.7	....	....	....	[b]480	229	952	8.0	..
Cm 241	25	Pleistocene gravel	8-29-53	54	5.8	.52	.02	.03	.8	23	7.3	38	2.1	52	24	72	.0	9.5	237	[a]88	45	393	6.6	4
Cm 257	97	Chemung formation	4-18-56	49	....	.12	....	....	....	....	....	....	....	168	....	37	....	....	....	[b]72	0	392	7.8	..
Cm 262	69	do.	4-19-56	49	....	1.5	....	....	....	....	....	....	....	306	....	17	....	....	....	[b]111	0	537	8.0	..
Cm 263	103	Pleistocene gravel	4-19-56	53	....	.04	....	....	....	....	....	....	....	426	....	5.0	....	....	....	[b]355	6	750	8.1	..
Cm 304	130	Chemung formation	4-19-56	52	....	.10	....	....	....	....	....	....	....	122	....	138	....	....	....	[b]165	65	700	7.7	..
Cm 305	107	Pleistocene sand	4-19-56	45	....	.42	....	....	....	....	....	....	....	105	....	2.1	....	....	....	[b]98	12	214	7.6	..
Cm 333	124	Pleistocene gravel	4-17-56	56	....	.73	....	....	....	....	....	....	....	214	....	2.6	....	....	....	[b]193	18	386	7.7	..
Cm 334	89	do.	4-17-56	48	....	1.4	....	....	....	....	....	....	....	177	....	4.2	....	....	....	[b]126	0	321	7.4	..
Cm 335	46	Chemung formation	4-17-56	49	....	.32	....	....	....	....	....	....	....	212	....	2.9	....	....	....	[b]140	0	382	7.8	..
Cm 355	150	do.	8-29-53	54	10	.09	.00	.30	.4	52	10	13	.2	198	39	.3	.0	.1	226	[a]171	9	355	7.6	4
Cm 368	82	Pleistocene gravel	4-17-56	48	....	3.8	....	....	....	....	....	....	....	216	....	371	....	....	....	[b]205	28	1,430	7.3	..
Cm 378	196	Pleistocene gravel	6-12-56	52	7.5	.11	.03	....	....	22	3.7	447	1.5	337	1.8	550	.6	.1	1,230	[a]70	0	2,320	7.9	17
Cm 387	80+	Pleistocene sand and gravel	4-17-56	51	....	.12	....	....	....	....	....	....	....	160	....	7.0	....	....	....	[b]151	20	305	7.9	..
Cm 412	75	Portage formation	6-12-56	50	12	.09	.03	....	....	20	4.3	48	.5	157	5.6	29	.1	.1	199	[a]68	0	355	7.8	7
Cm 422	36	Pleistocene deposits	4-17-56	52	....	2.7	....	....	....	....	....	....	....	46	....	100	....	....	....	[b]116	78	542	6.6	..
Cm 446	86	Chemung formation	4-17-56	51	....	.62	....	....	....	....	....	....	....	131	....	1.2	....	....	....	[b]95	0	240	7.8	..
Cm 466	68+	Pleistocene gravel	4-17-56	52	....	.36	....	....	....	....	....	....	....	308	....	2.3	....	....	....	[b]204	0	430	8.0	..
Cm 480	140	Chemung formation	4-17-56	49	....	.24	....	....	....	....	....	....	....	262	....	37	....	....	....	[b]240	25	558	7.6	..
Cm 481	80	do.	4-17-56	46	....	.12	....	....	....	....	....	....	....	282	....	220	....	....	....	[b]156	0	1,080	8.0	..
Cm 588	55	Pleistocene gravel	4-18-56	50	....	.17	....	....	....	....	....	....	....	134	....	9.8	....	....	....	[b]107	0	252	7.7	..
Cm 612	21	Pleistocene clay and silt	4-17-56	43	....	.13	....	....	....	....	....	....	....	264	....	7.5	....	....	....	[b]246	30	484	7.7	..
Cm 613	46	Chemung formation	4-18-56	48	....	.27	....	....	....	....	....	....	....	195	....	14	....	....	....	[b]216	56	461	7.7	..

[a] Includes hardness of all polyvalent cations reported.

[b] Hardness by complexiometric titration.

Table 1.—Chemical analyses of water from wells in Chemung County.

Part 2: Analyses by New York State Department of Health.

(Chemical constituents in parts per million)

Well number	*Depth (ft)*	*Water-bearing formation*	*Date of collection*	*Iron (Fe)*	*Manganese (Mn)*	*Nitrate (as N)*	*Chloride (Cl)*	*Sulfate (SO_4)*	*Fluoride (F)*	*Dissolved solids*	*Total hardness as $CaCO_3$*	*Total alkalinity as $CaCO_3$*	*pH*
Cm 1	173	Chemung formation	5-31-46	0.03	<0.01	....	15	....	....	....	46	85	7.8
Cm 28	24	Pleistocene gravel	4-13-54	.08	....	....	45	....	0.05	....	380	242	7.0
Cm 31	60	do.	11-10-43	None	....	....	2.0	44	....	....	62	46	7.3
Cm 36	20	do.	5-12-54	1.5	....	0.0	4.6	....	.2	....	200	189	7.3
Cm 39	40	do.	5-12-54	.05	....	5.0	18	....	....	....	280	195	7.3
Cm 41	20	do.	5-13-54	.50	....	2.0	60	....	.2	....	240	216	7.5
Cm 42	44	do.	4-13-54	.15	....	.7	17	....	.05	....	250	170	7.3
Cm 47	480	do.	11-30-45	<.03	<.01	....	3.4	38	....	292	330	202	7.4
Cm 48 and Cm 49	42+	do.	11-14-40	....	....	....	6.0	....	....	....	260	203	7.4
Cm 71	66	do.	12- 6-45	.1	<.01	....	1.2	22	....	156	106	96	8.0
Cm 73	40	do.	.....	....	....	2.0	2.8	....	....	....	124	112	7.7
Cm 81	38	do.	1-24-46	.03	....	....	1.2	....	....	....	116	85	7.7
Cm 82	125	Chemung formation	12- 7-45	4.5	.30	....	140	6.6	....	673	120	165	7.7
Cm 132	51	Pleistocene gravel	5-12-45	.15	....	.9	4.2	....	.05	....	176	144	7.5
Cm 139	120	Chemung formation	10-23-51	.27	.25	....	1.8	10	....	140	112	100	7.2
Cm 266	32	Pleistocene gravel	11- 1-51	.10	<.01	....	5.6	32	....	260	160	160	7.6
Cm 272	45	do.	5-12-54	.15	....	4.0	6.0	....	.05	....	250	195	7.3
Cm 302	93	Chemung formation	11-18-51	2.0	.20	....	1.0	15	....	179	112	125	7.9
Cm 312	7	Pleistocene gravel	11-13-51	1.5	<.01	....	.2	21	....	86	44	20	7.2
Cm 338	35	do.	11-16-51	.40	.05	....	310	<.3	....	766	200	196	7.9
Cm 345	110	Chemung formation	11-16-51	.70	.15	....	1.6	35	....	252	132	178	7.7
Cm 526	5	Pleistocene gravel	10-15-53	.10	....	5.0	5.8	....	<.05	....	56	25	6.2
Cm 563	146	Chemung formation	4-13-54	.30	....	.1	335	....	1.05	....	32	274	8.5
Cm 568	42	Pleistocene gravel	3-31-54	0.15	....	.6	5.4	....	0.05	....	152	136	7.5
Cm 580	49	do.	10-10-51	.20	....	4.0	17	....	....	....	280	207	7.5
Cm 585	95	Pleistocene sand	11-13-52	1.5	....	.0	1.8	....	.05	....	220	216	7.5
Cm 606	50	Pleistocene gravel and sand	1-27-54	....	....	....	....	....	.1	....	....	186	7.7
Cm 607	23	do.	10-22-53	.03	....	....	10	....	.2	....	210	158	7.6
Cm 608	26	do.	4- 1-54	....	....	....	....	....	.2	....	....	231	7.1

Table 2.—Comparison of the quality of ground water in Chemung County with standards of the U. S. Public Health Service.

Constituent or characteristic	U. S. Public Health standards (ppm)[1]	Water from wells in Chemung County		Total No. of analyses[2]	Number of analyses exceeding U. S. Public Health standards
		Maximum (ppm)	Minimum (ppm)		
Fluoride (F)	1.5	0.6	0.0	9	0
Iron (Fe) and manganese (Mn)	.3	[3]3.8	[3].01	33	10
Magnesium (Mg)	125	16	3.7	9	0
Chloride (Cl)	250	550	.3	33	2
Sulfate (SO_4)	250	78	1.8	9	0
Total solids	[4]500	[5]1,230	[5]86	18	2
Color	20	17	4	8	0

[1] United States Public Health Service, 1946, *Drinking water standards.*
[2] Includes only the analyses made by the U. S. Geol. Survey and listed in table 1, part 1.
[3] Iron only.
[4] Total solids up to 1,000 ppm are permissible where better water is not available.
[5] Includes only dissolved solids.

used for domestic and some industrial purposes. More than 50 percent of the analyses of water from Chemung County show a hardness of more than 120 ppm. The hardness of the samples analyzed ranged from 32 to 480 ppm.

Temperature

The temperature of water is important if the water is used for air conditioning, industrial cooling, or certain chemical processes. For most of these uses, water having a nearly constant temperature is desired. In this respect ground water is superior to surface water. The temperature of ground water fluctuates within a few degrees of the mean annual air temperature, which is about 49°F at Elmira. The fluctuations are greatest near the land surface and progressively less with depth. Temperature measurements made in those wells sampled for chemical analysis are shown in table 1. These measurements were made in August 1953 and April and June 1956. The average temperatures measured at these times are 53°F, 50°F, and 51°F, respectively.

REFERENCES CITED

Engeln, O. D., von, 1945, *Glacial diversion of drainage:* Assoc. Am. Geographers Annals, v. 35, no. 3, September.

Fairchild, H. L., 1909, *Glacial waters in central New York:* New York State Mus. Bull. 127.

Fenneman, N. M., 1938, *Physiography of eastern United States:* New York, McGraw-Hill Book Co., Inc.

Flint, R. S., 1947, *Glacial geology and the Pleistocene epoch:* New York, John Wiley and Sons.

Mordoff, R. A., 1949, *The climate of New York State:* Cornell Univ. Extension Bull. 764.

Tarr, R. S., 1905, *Water resources of the Watkins Glen quadrangle, New York,* in Fuller, M. L., *Contributions to the hydrology of eastern United States, 1904:* U. S. Geol. Survey Water-Supply and Irrigation Paper 110, p. 134–140.

Weeks, F. B., 1904, *New York,* in Fuller, M. L., *Contributions to the hydrology of eastern United States, 1903:* U. S. Geol. Survey Water-Supply and Irrigation Paper 102, p. 169–206.

———————, 1905, *New York,* in Fuller, M. L., *Underground waters of eastern United States:* U. S. Geol. Survey Water-Supply and Irrigation Paper 114, p. 82–92.

Williams, H. S., Tarr, R. S., and Kindle, E. M., 1909, *Description of the Watkins Glen-Catatonk district [New York]:* U. S. Geol. Survey Geol. Atlas, folio 169.

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 3: 12M, 16.8S, 5.6E. Drilled by W. Vanderhoff, Lockwood, N. Y.			
Hardpan and clay	0	172	172
Gravel, coarse	172	173	1
Cm 4: 12M, 16.4S, 4.8E. Drilled by W. Vanderhoff.			
Gravel, sand, and silt	0	8	8
Hardpan	8	40	32
Clay, yellow, and stones	40	49	9
Cm 5: 12M, 16.2S, 4.7E. Drilled by W. Vanderhoff.			
Clay, yellow	0	56	56
Gravel	56	60	4
Cm 10: 12M, 16.5S, 1.1E. Drilled by W. Vanderhoff.			
Gravel	0	28	28
Clay	28	112	84
Cm 14: 12M, 15.3S, 1.6E. Drilled by W. Vanderhoff.			
Gravel	0	20	20
Rock	20	60	40
Cm 15: 12M, 14.4S, 0.5E. Drilled by W. Vanderhoff.			
Hardpan	0	80	80
Gravel, cemented	80	190	110
Rock	190	326	136
Cm 16: 12M, 12.8S, 2.4W. Drilled by Barney Moravec, Penn Yan, N. Y.			
Clay and hardpan	0	18	18
Gravel	18	30	12
Cm 20: 12M, 14.8S, 4.4W. Driller unknown.			
Gravel, coarse	0	7	7
Stones	7	12	5
Cm 21: 12M, 12.7S, 3.8W. Drilled by W. Vanderhoff.			
Hardpan	0	30	30
Rock	30	80	50
Cm 22: 12M, 11.6S, 3.7W. Drilled by W. Vanderhoff.			
Sand and silt	0	15	15
Gravel, coarse	15	40	25
Clay, hard, blue	40	45	5
Cm 28: 12M, 11.1S, 1.9W. Driller unknown.			
Sand and silt	0	12	12
Quicksand	12	14	2
Sand and gravel	14	24	10
Cm 32: 12M, 10.7S, 2.7W. Drilled by Peter Kingsley, Elmira, N. Y.			
Sand, fine	0	20	20
Gravel	20	50	30
Cm 33: 12M, 10.5S, 2.9W. Drilled by W. Vanderhoff.			
Sand, yellow	0	61	61
Clay	61	106	45
Rock	106	203	97

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 35: 12M, 10.5S, 4.1W. Drilled by Peter Kingsley.			
Sand and silt	0	100	100
Sand, coarse, black	100	150	50
Cm 36: 12M, 9.4S, 3.7W. Driller unknown.			
Gravel	0	8	8
Clay	8	15	7
Gravel, coarse	15	20	5
Cm 38: 12M, 8.6S, 3.7W. Drilled by C. W. Crandall, Pine City, N. Y.			
Sand and gravel	0	60	60
Clay	60	110	50
Shale and sandstone	110	190	80
Cm 40: 12M, 8.1S, 3.8W. Drilled by Barney Moravec.			
Gravel	0	15	15
Clay	15	16	1
Gravel	16	60	44
Cm 42: 12M, 8.0S, 3.8W. Drilled by Layne–New York Co., Inc., New York, N. Y.			
Sand and silt	0	3	3
Clay and stones	3	15	12
Sand	15	30	15
Gravel	30	60	30
Rock	60		
Cm 44: 12M, 6.9S, 3.4W. Drilled by W. Vanderhoff.			
Gravel	0	8	8
Hardpan	8	12	4
Sand	12	30	18
Gravel	30	36	6
Quicksand	36		
Cm 47: 12M, 6.5S, 3.6W. Drilled by William Stothoff & Co., Flemington, N. J.			
Sand and silt	0	8	8
Clay, blue	8	12	4
Sand	12	30	18
Gravel	30	45	15
Quicksand	45		
Clay, blue		480	
Cm 50: 12M, 6.1S, 3.1W. Drilled by W. Vanderhoff.			
Clay	0	10	10
Gravel, sand, and silt	10	20	10
Sand and silt	20	25	5
Gravel and silt	25	50	25
Clay, clean, blue	50	219	169
Sand (water-bearing)	219	223	4
Gravel (water-bearing)	223	225	2

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 52: 12M, 5.5S, 0.9E. Drilled by C. W. Crandall.			
Sand and gravel	0	25	25
Quicksand	25	60	35
Clay, gray, and gravel	60	100	40
Rock	100		
Cm 66: 12M, 6.3S, 7.3W. Drilled by Barney Moravec.			
Soil	0	1	1
Gravel, sand, and silt	1	23	22
Sand and clay	23	30	7
Gravel, hardpan	30	36	6
Hardpan, tight	36	69	33
Clay and stones	69	79	10
Shale, dark-blue	79	155	76
Cm 70: 12M, 6.3S, 7.3W. Drilled by Barney Moravec.			
Soil	0	1	1
Gravel, sand, and silt	1	12	11
Sand, very fine	12	14	2
Gravel, fine, and sand	14	18	4
Gravel and silt	18	26	8
Clay, blue	26	51	25
Gravel	51	53	2
Clay, blue	53	60	7
Cm 72: 12M, 6.3S, 8.7W. Drilled by Dailey, address unknown.			
Gravel	0	18	18
Clay	18	40	22
Gravel	40	60	20
Cm 80: 12M, 7.1S, 10.3W. Driller unknown.			
Clay, silt, and sand	0	6	6
Gravel	6	15	9
Sand	15	20	5
Gravel (water-bearing)	20		
Cm 81: 12M, 7.7S, 10.9W. Driller unknown.			
Sand and silt	0	6	6
Clay, blue (hardpan)	6	10	4
Gravel	10	17	7
Sand	17	23	6
Gravel (water-bearing)	23		
Cm 132: 12M, 6.0S, 3.4W. Drilled by Layne-New York Co., Inc.			
Clay, gray	0	6	6
Sand, coarse, and medium gravel	6	18	12
Gravel, medium and coarse	18	37	19
Gravel, medium, and some clay	37	43	6
Gravel, medium, and coarse sand	43	51	8

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.) From	Depth (ft.) To	Thickness (ft.)
Cm 143: 12M, 1.4S, 0.8W. Drilled by Guaranteed Drilling Co., Elmira, N. Y.			
Clay and hardpan	0	6	6
Gravel and sand	6	23	17
Cm 146: 12M, 2.0S, 0.2W. Drilled by Guaranteed Drilling Co.			
Gravel, sand, and silt	0	6	6
Gravel, coarse	6	26	20
Sand, coarse	26	51	25
Cm 148: 12M, 0.1N, 0.8W. Drilled by Guaranteed Drilling Co.			
Boulders and clay	0	71	71
Shale	71	113	42
Cm 173: 12M, 4.5S, 5.0W. Drilled by Guaranteed Drilling Co.			
Soil	0	1	1
Clay	1	12	11
Shale, soft	12	19	7
Cm 175: 12M, 3.8S, 3.3W. Drilled by Guaranteed Drilling Co.			
Soil	0	1	1
Gravel, coarse	1	40	39
Gravel, fine	40	44	4
Cm 178: 12M, 7.8S, 1.4W. Drilled by Guaranteed Drilling Co.			
Soil	0	2	2
Clay	2	14	12
Hardpan	14	36	22
Shale	36	48	12
Cm 189: 12M, 0.6N, 8.2W. Drilled by Guaranteed Drilling Co.			
Clay	0	21	21
Sand	21	24	3
Rock	24	26	2
Cm 194: 12M, 4.1S, 7.4W. Drilled by C. W. Crandall.			
Gravel	0	15	15
Shale, soft, gray	15	93	78
Cm 220: 12M, 1.5S, 8.8W. Drilled by C. W. Crandall.			
Clay and hardpan	0	83	83
Shale	83	123	40
Cm 221: 12M, 1.9S, 10.1W. Drilled by C. Lumas and Son, Campbell, N. Y.			
Clay	0	77	77
Rock	77	108	31
Cm 223: 12M, 9.5S, 3.7W. Drilled by Guaranteed Drilling Co.			
Gravel	0	15	15
Clay	15	51	36
Sand, black	51	60	9
Cm 231: 12M, 5.1S, 10.4W. Drilled by Guaranteed Drilling Co.			
Hardpan	0	88	88
Shale	88	91	3

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 233: 12M, 6.5S, 10.5W. Drilled by Guaranteed Drilling Co.			
Clay	0	9	9
Rock, hard	9	55	46
Cm 254: 12M, 10.2S, 5.5W. Drilled by Guaranteed Drilling Co.			
Soil	0	1	1
Clay	1	16	15
Shale	16	130	114
Cm 257: 12M, 11.8S, 7.0W. Drilled by Guaranteed Drilling Co.			
Soil	0	2	2
Clay	2	18	16
Shale and sandstone	18	79	61
Cm 261: 12M, 13.4S, 5.9W. Drilled by Guaranteed Drilling Co.			
Gravel	0	40	40
Clay, blue	40	65	25
Hardpan	65	102	37
Sandstone	102	109	7
Cm 262: 12M, 16.3S, 2.8W. Drilled by Guaranteed Drilling Co.			
Gravel	0	52	52
Shale	52	69	17
Cm 263: 12M, 15.6S, 2.6W. Drilled by Guaranteed Drilling Co.			
Soil	0	2	2
Clay and sand	2	32	30
Clay and gravel with beds of sand	32	93	61
Gravel	93	103	10
Cm 265: 12M, 16.5S, 0.9W. Drilled by Guaranteed Drilling Co.			
Hardpan	0	10	10
Shale, hard	10	91	81
Gravel	91		
Cm 266: 12M, 7.8S, 3.9W. Drilled by Guaranteed Drilling Co.			
Soil	0	10	10
Gravel	10	40	30
Quicksand	40		
Cm 268: 12M, 11.2S, 1.1W. Drilled by Barney Moravec.			
Soil	0	1	1
Clay	1	4	3
Shale, soft	4	18	14
Shale, hard	18	75	57
Cm 269: 12M, 11.3S, 1.0W. Drilled by Guaranteed Drilling Co.			
Soil	0	1	1
Hardpan	1	40	39
Shale	40	48	8
Cm 270: 12M, 11.5S, 5.5W. Drilled by C. W. Crandall.			
Hardpan	0	99	99
Shale	99	149	50

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 272: 12M, 6.3S, 4.7W. Drilled by Barney Moravec.			
Soil	0	5	5
Gravel, coarse, and sand	5	10	5
Gravel, fine, and sand	10	15	5
Gravel, coarse, and sand	15	27	12
Gravel, fine, and sand	27	32	5
Gravel, coarse, and sand	32	35	3
Clay and gravel	35	40	5
Clay	40	45	5
Rock	45		
Cm 276: 12M, 13.8S, 2.6E. Drilled by Guaranteed Drilling Co.			
Hardpan	0	109	109
Rock	109	115	6
Cm 283: 12M, 11.5S, 2.0E. Drilled by Guaranteed Drilling Co.			
Soil and sand	0	10	10
Gravel and clay	10	30	20
Gravel, clean	30	46	16
Shale	46	53	7
Cm 293: 12M, 11.8S, 1.7W. Drilled by C. W. Crandall.			
Silt and sand	0	7	7
Gravel, medium-coarse, and some sand	7	28	21
Cm 298: 12M, 12.1S, 1.5W. Drilled by C. W. Crandall.			
Silt and sand	0	5	5
Gravel, medium to coarse	5	25	20
Cm 301: 12M, 13.8S, 4.3W. Drilled by C. W. Crandall.			
Gravel and sand	0	20	20
Quicksand	20	125	105
Sand (20 grade)	125	145	20
Cm 302: 12M, 13.6S, 4.8W. Drilled by C. W. Crandall.			
Loam and hardpan	0	60	60
Shale	60	93	33
Cm 303: 12M, 13.5S, 4.9W. Drilled by C. W. Crandall.			
Fill	0	15	15
Loam and hardpan	15	26	11
Shale, gray, hard to soft	26	278	252
Cm 304: 12M, 14.9S, 6.2W. Drilled by C. W. Crandall.			
Soil	0	1	1
Sand and gravel	1	18	17
Quicksand	18	78	60
Sand, brown	78	102	24
Shale, soft, gray	102	108	6

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 305: 12M, 15.4S, 6.8W. Drilled by C. W. Crandall.			
Soil	0	1	1
Sand and gravel	1	15	14
Quicksand	15	95	80
Clay, blue	95	105	10
Sand, fine	105	107	2
Cm 307: 12M, 5.6S, 4.0W. Drilled by C. W. Crandall.			
Gravel, sand, and silt	0	8	8
Sand and gravel	8	15	7
Clay, blue	15	17	2
Sand, brown, with some clay	17	26	9
Clay, blue	26	37	11
Sand and gravel	37	48	11
Cm 308: 12M, 7.1S, 2.7W. Drilled by F. E. Langham, Millerton, Pa.			
Soil	0	2	2
Gravel	2	17	15
Clay, red	17	34	17
Shale, broken, gray	34	50	16
Shale	50	189	139
Cm 309: 12M, 7.0S, 2.8W. Drilled by F. E. Langham.			
Soil	0	2	2
Gravel, coarse	2	37	35
Clay, blue	37	80	43
Shale, broken	80	124	44
Shale, medium-hard	124	126	2
Cm 310: 12M, 7.9S, 3.3W. Drilled by C. W. Crandall.			
Soil	0	2	2
Sand and gravel	2	45	43
Clay, clean, blue	45	267	222
Cm 323: 12M, 4.2S, 1.0E. Drilled by Guaranteed Drilling Co.			
Soil	0	1	1
Clay, gravel, and boulders	1	20	19
Shale, soft	20	22	2
Shale	22	86	64
Cm 333: 12M, 1.2S, 3.8W. Drilled by Guaranteed Drilling Co.			
Clay, clean, yellow	0	40	40
Sand, coarse, and gravel	40	45	5
Gravel, coarse (water-bearing)	45	57	12
Quicksand	57	124	67
Cm 334: 12M, 4.8S, 3.3E. Drilled by Barney Moravec.			
Soil	0	2	2
Gravel, coarse, and clay	2	7	5
Hardpan	7	14	7
Quicksand (water-bearing)	14	34	20
Unknown	34	78	44
Gravel	78	89	11

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 340: 12M, 3.9S, 0.7W. Driller unknown.			
Hardpan, hard, dense	0	10	10
Gravel	10	23	13
Cm 355: 12M, 6.9S, 0.5E. Drilled by Guaranteed Drilling Co.			
Soil	0	2	2
Clay	2	10	8
Shale	10	150	140
Cm 481: 12M, 13.1S, 0.6E. Drilled by Guaranteed Drilling Co.			
Clay	0	60	60
Rock, soft	60	80	20
Cm 501: 12M, 16.4S, 6.3W. Drilled by C. W. Crandall.			
Soil	0	1	1
Clay	1	60	59
Shale (small boulders above rock surface)	60	147	87
Cm 529: 12M, 11.2S, 6.4E. Driller unknown.			
Gravel	0	6	6
Hardpan	6	20	14
Cm 531: 12M, 17.0S, 9.7E. Drilled by W. Vanderhoff.			
Loam	0	10	10
Sand, fine	10	20	10
Gravel	20	36	16
Cm 532: 12M, 17.0S, 9.0E. Drilled by W. Vanderhoff.			
Sand, loamy	0	10	10
Clay	10	20	10
Sand, fine	20	35	15
Gravel, coarse	35	38	3
Cm 539: 12M, 13.8S, 0.1E. Drilled by W. Vanderhoff.			
Soil	0	2	2
Hardpan	2	117	115
Gravel, cemented	117	155	38
Shale	155	225	70
Cm 564: 12M, 5.4S, 0.7E. Drilled by Guaranteed Drilling Co.			
Sand (water at 10 ft.)	0	25	25
Silt, wet	25	47	22
Gravel and silt	47	88	41
Slate	88	93	5
Shale; well yielded ½ gpm	93	96	3
Shale; well yielded 2½ gpm	96	98	2
Shale; well yielded 5 gpm	98	128	30
Shale; well yielded 6 gpm (sulfur water)	128	135	7
Sandstone	135		
Cm 568: 12M, 6.0S, 3.4W. Drilled by Layne–New York Co., Inc.			
Soil	0	3	3
Gravel, sand, and blue clay	3	15	12
Gravel, medium, and fine sand	15	17	2
Clay, yellow, and gravel	17	28	11

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Continued)

	Depth (ft.) From	Depth (ft.) To	Thickness (ft.)
Cm. 570: 12M, 3.6S, 4.7W. Drilled by X-Cello Well Co., Millport, N. Y.			
Clay and stones	0	51	51
Gravel, fine	51	54	3
Quicksand	54	120	66
Cm 571: 12M, 3.6S, 4.7W. Drilled by X-Cello Well Co.			
Clay and gravel	0	70	70
Rock	70	97	27
Cm 575: 12M, 3.6S, 4.7W. Drilled by X-Cello Well Co.			
Clay and stones	0	61	61
Sand	61	86	25
Rock, black, hard	86	103	17
Gravel and sand	103	115	12
Cm 576: 12M, 3.2S, 4.9W. Drilled by C. W. Crandall.			
Soil	0	2	2
Gravel, coarse	2	33	31
Sand, fine	33	83	50
Shale	83	98	15
Cm 579: 12M, 2.2S, 5.0W. Drilled by Superior Drilling Co., Horseheads, N. Y.			
Gravel, with sand and stones	0	20	20
Quicksand (contains natural gas)	20	85	65
Sandstone, hard	85	96	11
Cm 580: 12M, 6.5S, 3.5W. Drilled by William Stothoff & Co.			
Gravel	0	10	10
Hardpan	10	27	17
Gravel with some clay	27	36	9
Gravel	36	49	13
Cm 585: 12M, 1.1N, 5.6W. Drilled by C. W. Crandall.			
Gravel, sand, and clay	0	18	18
Quicksand	18	95	77
Cm 587: 12M, 1.1N, 4.1W. Drilled by Guaranteed Drilling Co.			
Clay with rock fragments	0	21	21
Gravel	21	21½	½
Clay, clean, blue, plastic	21½	245	223½
Cm 588: 12M, 0.3N, 10.9W. Drilled by Layne–New York Co., Inc.			
Fill	0	2	2
Clay, tough, hard	2	13	11
Gravel, gray, sand, and clay	13	30	17
Gravel and sand	30	55	25
Cm 589: 12M, 8.3S, 3.3W. Drilled by Superior Drilling Co.			
Gravel and sand	0	45	45
Clay	45	75	30
Quicksand	75	280	205

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 1: Logs of wells.—(Concluded)

	Depth (ft.)		Thickness (ft.)
	From	To	
Cm 590: 12M, 3.2S, 11.0E. Drilled by W. Vanderhoff.			
Fill	0	5	5
Sand	5	25	20
Gravel, coarse, with sand and silt	25	35	10
Rock	35	96	61
Cm 593: 12M, 11.7S, 3.7W. Drilled by Layne–New York Co., Inc.			
Sand	0	30	30
Sand, packed	30	34	4
Sand	34	49	15
Sand and gravel	49	80	31
Rock	80		
Cm 594: 12M, 11.9S, 4.0W. Drilled by Layne–New York Co., Inc.			
Sand	0	10	10
Gravel and boulders	10	55	45
Clay and boulders	55	60	5
Rock	60	65	5
Cm 595: 12M, 9.8S, 2.6W. Drilled by Layne–New York Co., Inc.			
Soil and clay	0	12	12
Sand and gravel	12	105	93
Rock	105		
Cm 596: 12M, 9.9S, 2.6W. Drilled by Layne–New York Co., Inc.			
Clay and boulders	0	12	12
Sand and gravel	12	105	93
Sand	105	125	20
Rock	125		
Cm 597: 12M, 13.5S, 3.5W. Drilled by Layne–New York Co., Inc.			
Gravel, sand, and silt	0	12	12
Gravel and boulders	12	30	18
Clay	30	50	20
Quicksand, muddy	50	130	80
Rock	130	132	2
Cm 598: 12M, 13.8S, 4.4W. Drilled by C. W. Crandall.			
Gravel, sand, and clay	0	20	20
Quicksand	20	55	35
Clay	55	60	5
Sand	60		
Cm 602: 12M, 7.4S, 9.4W. Drilled by Guaranteed Drilling Co.			
Topsoil; gravelly hardpan	0	10	10
Gravel, clean	10	35	25
Gravel and clay	35	40	5
Gravel	40	45	5
Gravel (water-bearing)	45	57	12
Sand, yellow	57		

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 2: Logs of test holes.

Test-hole numbers preceded by "DH" were drilled by Corps of Engineers, U. S. Army, as part of the Elmira Flood Control Project. Numbers preceded by "NY" were drilled by New York State Department of Public Works as part of the State highway construction program. Altitudes of land surface were determined by spirit leveling and are reported to the nearest foot. The headnotes contain all data available for the holes. Therefore, no records of test holes are listed in table 4, "Records of Wells."

	Depth (ft.)		Thickness (ft.)
	From	To	
DH 6: 12M, 11.4S, 3.2W; Elmira, on north bank of Chemung River, south of building at 315 W. Water St. and 300 ft. west of Mill Dam. Drilled 1941. Altitude 850 ft.			
Fill. Silty, sandy; gravel with scattered cinders and brick	0	8	8
Gravel, sandy, variably silty, compact, noncohesive, brown, moist	8	24.5	16.5
Sand, silty, with traces of clay and gravel. Very compact, slightly cohesive, brown, moist	24.5	27	2.5
Gravel, sandy, silt-bound, very compact (hardpan), slightly cohesive, brown, moist	27	40	13
DH 14: 12M, 11.9S, 1.6W; Elmira, W. Second St. at Hoffman Brook. Drilled 1941. Altitude 865 ft.			
Gravel, sandy, silty, loose, moist (topsoil)	0	1	1
Gravel, sandy, silty, with trace of clay, compact, noncohesive, brown, moist to wet. (Floodplain gravel)	1	30.5	29.5
Silt, clayey, sandy, compact, cohesive, gray, moist. (Lake silt with some rock flour). Liquid limit 22.7, plastic limit 19.4 for sample from 36-ft. depth	30	40.5	10.5
DH 18: 12M, 9.9S, 2.7W; Elmira, 1.2 mi. northeast of Post Office, on west bank of Newtown Creek 400 ft. north of projected Pattinson St. Drilled 1942. Altitude 850 ft.			
Silt, clayey, sandy, slightly compact, slightly cohesive, brown, moist. Sand content increases with depth	0	8.5	8.5
Sand, gray, with thin streaks of silt, slightly compact, noncohesive	8.5	13	4.5
Silt, clayey, sandy, compact, cohesive, gray, wet. Some silty, sandy, clayey gray gravel at 16.5 ft. Rock flour predominant at depth	13	31	18
DH 22: 12M, 9.2S, 3.3W; Elmira, in a swamp, 80 ft. south of Diven Creek and 500 ft. west of Lake St. Drilled 1942. Altitude 853 ft.			
Silt, clayey, sandy, soft, cohesive, plastic, gray, moist, with streaks of peat	0	33	33
Sand, coarse, silty, compact, noncohesive, gray, wet, with scattered pebbles	33	35	2
Gravel, silty, sandy, compact, noncohesive, wet	35	42	7
DH 24: 12M, 9.5S, 3.5W; Elmira, in Eldridge Lake, 40 ft. west of the east side of lake. Drilled 1942. Altitude of lake 851 ft. (approx.).			
Water	0	4.5	4.5
Muck, soft, black	4.5	6	1.5
Marl, whitish-gray, and soft peat	6	7.5	1.5
Peat, soft, brown, with scattered shells	7.5	11.5	4
Sand, gravelly, silty, compact, gray	11.5	23.5	12

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 2: Logs of test holes.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
DH 26: 12M, 9.4S, 2.7W; Elmira, 1.8 mi. northeast of Post Office, about 400 ft. east of New York State Electric & Gas Corp. power transmission line, near proposed N. Y. Highway 17 about 900 ft. north of the Elmira city line. Drilled 1945. Altitude 943 ft.			
Gravel and sand, stony, silty, clayey, compact, semicohesive, moist. (Gravel is composed of angular fragments of sandstone and shale similar to the local bedrock)	0	35	35
DH 28: 12M, 9.7S, 2.5W; Elmira, 1.4 mi. northeast of Post Office, about 600 ft. east of New York State Electric & Gas Corp. power transmission line and about 900 ft. north of incinerator. About 200 ft. east of proposed N. Y. Highway 17. Drilled 1945. Altitude 947 ft. (Material from DH 28 is similar to that from other test holes in the terrace on the east side of the Elmira-Horseheads valley).			
Topsoil, dark, silty, gravelly, clayey, with roots	0	1	1
Silt and gravel, angular, clayey, sandy, semicompact, cohesive, light tan, moist	1	5	4
Gravel, sandy, silty, clayey, semicompact, cohesive, moist	5	46	41
DH 31: 12M, 11.3S, 2.2W; Elmira, on north bank of Chemung River, 30 ft. southwest of the southwest corner of New York State Electric & Gas Corp. powerhouse, and 70 ft. east of projected center line of Sullivan St. Drilled 1946. Altitude 851 ft.			
Fill. Cinders, sand, silt, and gravel, compact and dry	0	5	5
Gravel, sandy, silty, with trace of clay. Compact, slightly moist	5	8.5	3.5
Sand and silt, with trace of clay. Compact very moist. Brown 8.5 to 15 ft., gray 15 to 20 ft	8.5	20	11.5
Gravel, sandy, silty, compact, brown, moist. Silt decreases with depth. Material becomes increasingly permeable from 20 ft. to 45 ft	20	45	25
DH 49: 12M, 11.6S, 1.9W; Elmira, on south side of Chemung River, 15 ft. west of toe on landward side of levee about midway between Esty and Liberty Streets. Drilled 1950. Altitude 844 ft. (approx.).			
Silt, sandy, soft, brown, damp	0	8.2	8.2
Gravel, sandy, with few boulders	8.2	41	32.8
Silt, clayey, soft, moist	41	50	9
NY 2: 12M, 7.8S, 10.4W; 0.8 mi. west of Big Flats, about 1,000 ft. north of D. L. & W. RR. and 800 ft. east of a graded road. On right of way of proposed N. Y. Highway 17 at bridge site near small creek. Drilled 1952. Altitude 891 ft.			
Clay, gray, silty. Trace of fine gravel and sand	0	10.5	10.5
Gravel, coarse, sandy	10.5	20.5	10
Clay, brown, sandy	20.5	25.5	5
Sand, fine, brown, gravelly	25.5	30.5	5
Gravel, fine, sandy	30.5	35.5	5
Silt, gray	35.5	80.5	45

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 2: Logs of test holes.—(Continued)

	Depth (ft.) From	Depth (ft.) To	Thickness (ft.)
NY 3: 12M, 7.7S, 10.0W; 0.4 mi. northwest of Big Flats, about 500 ft. east of Owen Hollow Road and 1,100 ft. north of D. L. & W. RR. On right of way of proposed N. Y. Highway 17 at bridge site near small creek. Drilled 1952. Altitude 897 ft.			
Clay, brown, sandy. Moist, plastic, and sticky	0	5.5	5.5
Gravel, fine, gray, clayey, sandy, loose	5.5	20.5	15
Clay, gray. Traces of gravel and sand. Wet, plastic, and sticky	20.5	25.5	5
Silt, gray, sandy. Wet, compact, sticky	25.5	55.5	30
NY 4: 12M, 7.2S, 9.0W; 1 mi. northeast of Big Flats, on right of way of proposed N. Y. Highway 17 near bridge site at Cuthrie Run. Drilled 1952. Altitude 913 ft.			
Gravel, coarse, silty, sandy	0	5.5	5.5
Gravel, fine, sandy, clayey	5.5	10.5	5
Gravel, coarse, clayey, sandy	10.5	14.3	3.8
Clay, gray, sandy, gravelly	14.3	21.5	7.2
Gravel, coarse, gray clayey, sandy	21.5	23	1.5
Clay, gray, gravelly, sandy	23	24.2	1.2
NY 6: 12M, 7.0S, 8.2W; 1.7 mi. northeast of Big Flats, on a knoll 300 ft. east of Kahler Rd. 600 ft. north of junction of Lowe Rd. On right of way of proposed N. Y. Highway 17. Drilled 1952. Altitude 970 ft. (approx.).			
Clay, brown, sandy, gravelly. Moist and sticky	0	2	2
Silt, brown, gravelly, sandy. Dry. Crumbles easily	2	6	4
Clay, gray, sandy, gravelly. Dry, hard, cohesive, and plastic	6	8	2
Clay, brown, gravelly, sandy. Wet, sticky, cohesive, and plastic	8	9.5	1.5
NY 7: 12M, 6.7S, 7.1W; 3.6 mi. west of Horseheads, on right of way of N. Y. Highway 17 near bridge site at Singsing Creek. Drilled 1952. Altitude 930 ft.			
Gravel, coarse, sandy, with brown silt	0	10.5	10.5
Gravel, coarse, sandy, with gray silt	10.5	15.5	5
Gravel, fine, sandy, with gray silt	15.5	20.5	5
Gravel, coarse, sandy, with gray silt	20.5	49.3	28.8
NY 8: 12M, 7.3S, 3.0W; 1.6 mi. southeast of Horseheads, on right of way of proposed N. Y. Highway 17 near bridge site at Latta Brook about 500 ft. west of New York State Electric & Gas Corp. power line. Drilled 1946. Altitude 886 ft.			
Stones, gravel, sand, and silt. Creek bed deposit	0	11.5	11.5
Gravel, fine, sandy, silty, with small amount of yellow clay. Wet	11.5	16.5	5
Gravel, fine, sandy, silty. Very wet	16.5	25.3	8.8
Clay, gray, sandy, gravelly, stony. Wet	25.3	29.5	4.2
Silt and sand, fine, gray. Wet	29.5	31	1.5
Clay, gray. Moist and plastic	31	34.8	3.8
Sand, fine, gray, silty, clayey	34.8	41.3	6.5
Clay, gray, sandy. Moist and plastic	41.3	51	9.7

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 2: Logs of test holes.—(Continued)

	Depth (ft.)		Thickness (ft.)
	From	To	
NY 9: 12M, 10.4S, 2.1W; Elmira, 1.1 mi. northeast of Post Office, near southeast corner of intersection of Water Cave Hill Rd. and Tuttle Ave. On right of way of proposed N. Y. Highway 17. Drilled 1953. Altitude 892 ft.			
Stones, coarse, angular, sandy, silty. Brown nonplastic, and noncohesive	0	15.5	15.5
Stones, coarse, angular, sandy, silty. Gray, nonplastic, and noncohesive.	15.5	29.5	14
Silt and clay, stony, sandy. Plastic and cohesive	29.5	34.5	5
Silt and clay, gray. Plastic and cohesive	34.5	38.5	4
Silt and clay, gray. Trace of fine, angular stone and coarse sand. Plastic and cohesive	38.5	43.5	5
Silt and clay, gray. Plastic and cohesive	43.5	58.5	15
NY 11: 12M, 11.2S, 1.8W; Elmira, 1.1 mi. east of Post Office, near southwest corner of junction of Water St. and Jerusalem Rd. Drilled 1953. Altitude 851 ft.			
Stones, coarse, angular, with silt and sand	0	10.5	10.5
Silt, sandy, with some fine angular stone. Brown, nonplastic, and noncohesive	10.5	15.5	5
Silt, sandy, with some fine angular stone. Gray, nonplastic, and noncohesive	15.5	20.5	5
Stones, coarse, angular, with sand, silt, and clay. Gray, nonplastic, and noncohesive to 30 ft. Slightly plastic and cohesive below 30 ft	20.5	34.5	14
Clay and silt. Gray, plastic, and compact	34.5	59.5	25
NY 12: 12M, 11.1S, 1.8W; Elmira, 1.1 mi. east of Post Office on right of way of proposed N. Y. Highway 17 at culvert site about 900 ft. north of Water St. interchange. Drilled 1953. Altitude 855 ft.			
Stones, coarse, angular, with silt and sand. Dry to 5 ft. Wet below 5 ft	0	10.5	10.5
Stones, fine, angular, with silt and sand. Wet and nonplastic	10.5	20.5	10
Stones, coarse, angular, with silt and sand. Moist, nonplastic, and compact	20.5	29.8	9.3
Bedrock (gray sandstone)	29.8	30.3	.5
NY 13: 12M, 10.5S, 2.1W; Elmira, 1.1 mi. northeast of Post Office, near west abutment of East St. overpass at D. L. & W. RR. tracks. Drilled 1953. Altitude 892 ft.			
Stones, coarse, angular, with silt and sand. Plastic and semicompact to 5.5 ft. Noncohesive below 5.5 ft	0	30.5	30.5
Clay, gray. Some angular stone in top few ft. Cohesive and compact	30.5	70	39.5

Table 3.—Logs of selected wells and test holes in Chemung County.

Part 2: Logs of test holes.—(Concluded)

	Depth (ft.)		Thickness (ft.)
	From	To	
NY 14: 12M, 10.8S, 2.0W; Elmira, 1.0 mi. east of Post Office at Church St. bridge over Newtown Creek. Drilled 1953. Altitude 854 ft.			
Silt and stones, coarse, angular, with sand. Brown, nonplastic, and noncohesive	0	15.5	15.5
Silt and sand with some fine angular stones. Gray, nonplastic, and noncohesive	15.5	25.5	10
Stones, coarse, angular, and silt with some sand. Gray, nonplastic, noncohesive	25.5	34.5	9
Stones, coarse, angular, with sand and some silt. Gray, nonplastic, and noncohesive	34.5	39.5	5
Sand, coarse to fine, silt, and trace of fine angular stones	39.5	44.5	5
Clay, silty, with trace of fine angular stone. Gray, plastic, and cohesive	44.5	63.5	19
Clay, silty. Gray, plastic, and cohesive	63.5	68.5	5
Stone, coarse, angular, with some silt and coarse sand. Gray, slightly plastic, and compact	68.5	73.5	5
NY 15: 12M, 10.8S, 1.9W; Elmira, 0.9 mi. east of Post Office, near west abutment of Church St. overpass at D. L. & W. RR. Drilled 1953. Altitude 852 ft.			
Stones, coarse, rounded, with some sand and silt. Brown, dry, nonplastic, noncohesive	0	5.5	5.5
Stones, coarse, angular, and sand. Brown, nonplastic, and noncohesive	5.5	25.5	20
Stones, fine, angular; clay and coarse sand. Gray, plastic, and cohesive	25.5	30.5	5
Stones, coarse, angular; sand, silt, and clay. Gray, plastic, and cohesive	30.5	45.5	15
NY 19: 12M, 6.6S, 3.3W; 1 mi. southeast of Horseheads, on west bank of Newtown Creek at south end of bridge site for proposed N. Y. Highway 17. Drilled 1946. Altitude 871 ft.			
Topsoil, coarse gravel (creek bed)	0	4	4
Gravel, fine, sandy, silty. Very wet	4	21.5	17.5
Gravel, coarse, sandy, silty, with trace of yellow clay. Wet	21.5	30	8.5
Gravel, fine, sandy, silty. Wet	30	35	5
Sand, fine, brown and gray. Wet	35	37.8	2.8
Clay, plastic, gray, with fine sand. Moist	37.8	48	10.2
Sand, fine, gray, silty. Wet	48	51	3

Table 4.—Records of selected wells in Chemung County.

Location: Locations are given in miles from the intersection of meridian "12" (76°45'W.) and parallel "M" (42°15'N.) (for full discussion of location see "Introduction").

Altitude: Approximate altitude above mean sea level from topographic maps.

Type of well: Drl, drilled; Drv, driven .

Water level: Measurements made by U. S. Geol. Survey are reported to nearest tenth of a foot; others to nearest foot.

Use: A, agricultural; C, commercial; H, home; I, industrial; M, municipal; O, other; R, recreational; U, unused; a, air conditioning; b, boiler feed; c, cooling; d, domestic; i, irrigation; l, livestock; p, processing; s, sanitary and service.

Remarks: Information is reported unless otherwise indicated; meas., measured by U. S. Geol. Survey personnel; gpm, gallons per minute; (a) analysis in table 1; (b) log in table 3, part 1.

Well number	*Location*	*Owner or occupant*	*Date completed*	*Altitude above sea level (ft)*	*Type of well*	*Depth (ft)*	*Depth cased (ft)*	*Diameter (in.)*	*Depth to bedrock (ft)*	*Principal water-bearing material*	*Water level (ft below land surface)*	*Yield (gpm)*	*Use*	*Remarks*
Cm 1	12M, 16.8S, 8.1E	Flanigan's Dairy	1945	820	Drl	173	89	6	88	Sandstone and shale	6	10	Ibcs	Drawdown 40 ft after pumping 15 gpm for 30 minutes. (a).
Cm 2	12M, 16.7S, 6.5E	Chemung Methodist Church	1945	850	Drl	89	51	6	50	do.	30	8	H	
Cm 3	12M, 16.8S, 5.6E	Mr. Kilpatrick	1909	810	Drl	173	172	6	....	Gravel	18	35	Adil	(b).
Cm 4	12M, 16.4S, 4.8E	William Tanner Esta te	1938	970	Drl	49	....	6	....	do.	25	25	H	(b).
Cm 5	12M, 16.2S, 4.7E	Town of Chemun g	1939	980	Drl	60	59	6	....	do.	27	....	UC	School supply. Water cloudy. (b).
Cm 6	12M, 15.8S, 3.0E	Mr. Huff	1875	795	Dug	21	21	36	....	do.	8	....	Adl	
Cm 9	12M, 16.5S, 1.1E	Village of Wellsburg	1895	820	Drl	28	....	4	....	do.	5	100	M	Wells Cm 9, 10, and two other wells connected to common pump.
Cm 10	12M, 16.5S, 1.1E	do.	1939	845	Drl	38	....	8	....	do.	5	500	M	Well drilled to depth of 112 ft. See remarks for Cm 9. (b).
Cm 11	12M, 16.3S, 1.2E	Dairymen's League Coop. Assoc., Inc.	1940	820	Drv	28	25	1¼	....	do.	7	15	UI	Well finished with drive point. Pumps sand.
Cm 12	12M, 16.3S, 1.2E	do.	1940	820	Drv	28	25	2	....	do.	7	15	Ibcs	Cm 12 and another well on common pump. Combined yield 25 gpm. Well finished with drive point.
Cm 14	12M, 15.3S, 1.6E	Lowman Methodist Church	1945	825	Drl	60	21	6	20	Sandstone and shale	25	16	Cs	(b).
Cm 15	12M, 14.4S, 0.5E	C. E. Ketchum	1942	940	Drl	326	....	6	190	do.	100	....	U	Well yielded salty water below depth of 250 ft. Well capped. (b).
Cm 16	12M, 12.8S, 2.4W	Remington Rand, Inc.	1942	850	Drl	30	....	12	....	Gravel	16	1,000	Ic	Finished with 12-ft length of 12-in.-diameter screen. (b).
Cm 17	12M, 12.8S, 2.4W	do.	1942	850	Drl	30	....	12	....	do.	19	1,000	Ic	Finished with 12-ft length of 12-in.-diameter screen.
Cm 18	12M, 12.8S, 2.4W	do.	1942	850	Drl	30	....	10	....	do.	20	400	Ic	Finished with 10-ft length of 10-in.-diameter screen.
Cm 19	12M, 13.9S, 3.6W	Min-Char Mfg. Co.	....	890	Drl	80	....	6	....	do.	15	10	Ip	Finished with screen. Well yielded 10 gpm for 6 hrs.
Cm 20	12M, 14.8S, 4.4W	E. B. Strope	1920	1,000	Dug	12	12	42	....	do.	7	....	Al	Water level fluctuates in response to changes in stage of Newtown Creek. (b).
Cm 21	12M, 12.7S, 3.8W	Ernest Hapeman	1939	940	Drl	80	30	6	30	Sandstone and shale	4	10	Adl.	Well yielded 10 gpm for 2 hrs. (b).
Cm 22	12M, 11.6S, 3.7W	L. J. Houck & Sons, Inc.	1945	860	Drl	45	....	6	....	Gravel	16	50	Ibcs	Well yielded 50 gpm for 8 hrs. Finished with 8-ft length of 6-in.-diameter screen. (b).
Cm 23	12M, 11.6S, 3.7W	D. P. Hammond Dairy	1938	850	Drl	45	....	6	50	do.	15	60	Ibcs	Well yielded 60 gpm for 7 hrs.
Cm 24	12M, 11.3S, 3.1W	Colonial Theatre	1941	850	Drl	40	28	6	....	do.	20	160	Ca	Well yielded 160 gpm for 10 hrs.
Cm 25	12M, 11.3S, 3.0W	The Gorton Coy, Inc.	1943	850	Drl	50	....	6	....	do.	14	100	Ca	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 26	12M, 11.2S, 3.0W	S. F. Iszard Co.	1941	850	Drl	38	37	8	....	Gravel	19	300	Ca	Finished with 10-in. length of 8-in.-diameter screen.
Cm 27	12M, 11.2S, 3.0W	Mark Twain Hotel	1929	860	Drl	60	....	8	....	do.	16	35	Cc	Well yielded 35 gpm for 32 hrs. Well was 85 ft deep. Casing collapsed at 60 ft. Well flows when Chemung River is at flood stage. (a).
Cm 28	12M, 11.1S, 1.9W	Kennedy Valve Mfg. Co.	1907	850	Dug	24	....	144	....	do.	18	750	O	Well yielded 750 gpm for 24 hrs. Fire-protection well. (a). (b).
Cm 29	12M, 11.0S, 2.5W	St. Joseph's Hospital	1927	850	Drl	75	75	6	100	do.	15	5	UC	Well drilled to 213 ft. Casing dynamited at 75 ft. Yield insufficient; well abandoned.
Cm 30	12M, 10.8S, 2.8W	Spaulding Bakeries, Inc.	1925	865	Drl	66	....	5	....	do.	12.3 1-1-56	5	UI	Water-stage recorder installed 10-14-55 by U. S. Geol. Survey, Albany.
Cm 31	12M, 10.8S, 3.1W	Swift & Co.	1935	870	Drl	60	52	6	....	do.	18	5	Ibc	Finished with 8-ft length of 5-in.-diameter screen. (a).
Cm 32	12M, 10.7S, 2.7W	Trayer Products, Inc.	1931	860	Drl	40±	40±	6	....	do.	16	4	Ic	Well originally 80 ft deep. Casing dynamited at 40 ft. (b).
Cm 33	12M, 10.5S, 2.9W	Royal Dairy Creamery	1944	860	Drl	....	61	6	106	Sand	20	35	Ic	Yielded 1 gpm at 106 ft with little increase to total depth of 203 ft. Casing pulled to 61 ft. (b).
Cm 34	12M, 10.4S, 3.2W	S. M. Flickinger Co., Inc.	1930	870	Drl	65	....	6	80	Gravel	18	200	Cc	
Cm 35	12M, 10.5S, 4.1W	Arnot Ogden Memorial Hospital	1920	890	Drl	142	....	6	....	Sand	42.5 5-10-44	6	Cc	(b).
Cm 36	12M, 9.4S, 3.7W	Hardinge Bros., Inc.	1941	860	Dug	20	20	54	....	Gravel	16	10	Ic	Well yielded 10 gpm for 24 hrs. Water 7 ft below land surface in nearby excavations. (a). (b).
Cm 37	12M, 8.6S, 3.8W	Thatcher Glass Mfg. Co., Inc.	1910	850	Dug	22	....	72	....	do.	Flows	100	Ic	Drawndown 16 ft after pumping 100 gpm for 8 hrs. Static water level 3 ft above surface.
Cm 38	12M, 8.6S, 3.7W	do.	1945	870	Drl	190	110	6	110	Sandstone and shale	24	11	UI	Yield insufficient. Well abandoned. (b).
Cm 39	12M, 8.4S, 3.6W	Fawn Beverage Co.	1925	870	Drl	40	....	6	....	Gravel	15	10	Icp	Well yielded 10 gpm for 8 hrs. Well finished with screen. (a).
Cm 40	12M, 8.1S, 3.8W	American Bridge Co.	1943	880	Drl	50	....	10	....	do.	30	800	Ic	Drawndown 1.5 ft after pumping 800 gpm for 24 hrs. Finished with 10-ft length of 10-in.-diameter screen. (b).
Cm 41	12M, 8.0S, 3.9W	Elmira Knitting Mills	1905	890	Drl	20	....	6	....	do.	5–20	250	Ip	Quality unsatisfactory for dyeing. Used only for rinsing. (a).
Cm 42	12M, 8.0S, 3.8W	Bendix Aviation Corp.	1941	880	Drl	44	....	8	60	do.	10–12	1,000	Ias	Well drilled to depth of 60 ft. Finished with screen. (a). (b).
Cm 43	12M, 7.8S, 3.3W	Blostein Animal Hospital	1922±	885	Drl	60	....	6	....	do.	12–14	5	UC	Well yielded 5 gpm for 8 hrs. Finished with screen.
Cm 44	12M, 6.9S, 3.4W	Roy's Dairy	1924	880	Drl	33+	33	8	....	do.	18	30	UI	Well yielded 30 gpm for 8 hrs. (b).
Cm 45	12M, 6.9S, 3.4W	do.	1944	880	Drl	33+	33	6	....	do.	18	35	ACI	Well yielded 35 gpm for 3 hrs.
Cm 46	12M, 6.9S, 3.4W	do.	1900	880	Drl	34	....	6	....	do.	23.7 1-1-56	....	UI	Water-stage recorder installed 10-12-55 by U. S. Geol. Survey, Albany. Recorder removed 6-29-56.

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 47	12M, 6.5S, 3.6W	Dairymen's League Coop. Assn., Inc.	1924	900	Drl	480	40	8	....	Gravel	..	100	Ibcs	Well drilled to 480 ft. Casing filled with gravel to depth of 40 ft to prevent heaving of quicksand. Dynamited about 40 ft below surface. (a). (b).
Cm 48	12M, 6.5S, 3.6W	do.	1931	900	Drl	42+	42	10	....	do.	30	150	Ibcs	Well yielded 150 gpm for 24 hrs. Finished with 10 ft of slotted casing. (a).
Cm 49	12M, 6.5S, 3.6W	do.	1931	900	Drl	42+	42	10	....	do.	30	175	Ibcs	Well yielded 175 gpm for 24 hrs. Finished with 10 ft of slotted casing. (a).
Cm 50	12M, 6.1S, 3.1W	Village of Horseheads	1944	890	Drl	225	225	6	....	do.	3	30	UM	Well yielded 30 gpm for 2 hrs. (b).
Cm 51	12M, 5.5S, 0.9E	Burton Green	1944	1,105	Drl	193	114	6	114	Sandstone and shale	18	7	H	Well flowed when drilled.
Cm 52	12M, 5.5S, 0.9E	Clarence W. Johnson	1945	1,100	Drl	172	101	6	101	do.	17.2 4-19-46	....	H	Water tastes salty and contains natural gas. (b).
Cm 53	12M, 5.3S, 0.9E	Coralie Borden	1944	1,150	Drl	274	....	6	200+	do.	60	....	H	Water is black and has disagreeable taste.
Cm 54	12M, 4.9S, 0.3W	Lyman Hoff	1945	1,140	Drl	190	102	6	102	do.	111.3 4-19-46	40	Adl	
Cm 55	12M, 4.4S, 1.9W	Ralph M. Olin	1920	980	Drl	60	50	6	50±	do.	7	....	Al	Water has high iron content.
Cm 56	12M, 4.4S, 2.0W	do.	1938	970	Drl	51	30	6	30±	do.	7	5	Ad	do.
Cm 57	12M, 4.2S, 2.3W	Ritzland Dairy Farm	1945	960	Drv	21	18	2	....	Gravel	4	50	Ccs	Finished with drive point.
Cm 58	12M, 4.1S, 3.4W	William A. Segar	1900	930	Drl	40	....	6	....	Gravel	8	30+	Adl	
Cm 59	12M, 1.7S, 5.0W	George L. Westervelt	1940±	940	Drl	72	72	6	....	do.	40	....	H	
Cm 60	12M, 1.6S, 5.0W	Emma Stanbro	....	930	Drl	122	122	6	....	Sand	32	....	H	Quicksand filled pipe at depth of 80 ft.
Cm 61	12M, 1.0S, 4.8W	Otto Russell	....	890	Drv	32	32	1¼	....	Gravel	..	....	Adl	Well driven in bottom of dug well. Finished with drive point.
Cm 62	12M, 0.1N, 4.7W	Town of Veteran	1934	920	Drl	222	222	4	....	do.	40	4	Cs	Well flowed when drilled. School well. Quicksand between depths of 85 and 212 ft.
Cm 63	12M, 1.1N, 4.6W	Frank Grouch	1909	735	Drl	225	225	6	....	Sand	+2.0 5-17-54	....	UH	Water level 15 ft above surface in 1909. Well filled with sand.
Cm 64	12M, 2.2N, 5.0W	H. E. Lundin	1944	920	Drl	325	40	6	40	Sandstone and shale	187	....	H	Bedrock crops out nearby.
Cm 65	12M, 5.9S, 5.3W	Fannie K. Tong	1925±	970	Drl	67	....	6	....	Gravel	20	20	Adl	
Cm 66	12M, 6.3S, 7.3W	Schweizer Aircraft Corp.	1942	935	Drl	155	....	6	79	Sandstone and shale	9.1 10-1-42	7	O	Test hole. (b).
Cm 67	12M, 6.3S, 7.3W	do.	1942	935	Drl	29	....	8	....	Gravel	10.2 10-1-42	70	Ibs	Drawdown 16 ft after pumping Cm 68 at rate of 110 gpm for 16 hrs. Drawdown 0.05 ft after pumping Cm 68 at rate of 100 gpm for 22 minutes.
Cm 68	12M, 6.3S, 7.3W	do.	1942	935	Drl	26	....	8	....	do.	8.3 10-1-42	315	O	Drawdown 1.2 ft after pumping 100 gpm for 22 hrs. Drawdown 1.5 ft after pumping 110 gpm for 16 hrs. Finished with 10-ft length of 7-in.-diameter screen. Fire protection only.
Cm 70	12M, 6.3S, 7.3W	do.	1942	935	Drl	60	....	6	....	Clay	7.8 10-1-42	....	O	Test hole. (b).

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 71	12M, 6.3S, 8.2W	Frank J. Wells	1920	950	Drl	66	....	6	....	Gravel	..	....	Adl	(a).
Cm 72	12M, 6.3S, 8.7W	Elmer H. Wheaton	1941	940	Drl	60	....	6	....	do.	25	30	AI	(b).
Cm 73	12M, 7.8S, 9.1W	Town of Big Flats	1915	910	Drl	40	....	6	....	..	15	....	Cs	(a).
Cm 74	12M, 7.7S, 9.4W	Grange League Federation Soil Building Service, Inc.	1915	910	Drv	25	19	1½	....	Gravel	15	....	Is	Well finished with drive point.
Cm 75	12M, 8.1S, 9.5W	Mr. Hammond	1940	900	Drv	26	....	1½	....	Gravel	18	....	Abdl	Well driven in bottom of adequate dug well to avoid contamination.
Cm 76	12M, 8.9S, 9.3W	Maynard Smith & Son	1920	890	Drv	19	....	1½	....	do.	16	....	Acl	Finished with drive point.
Cm 77	12M, 7.1S, 10.3W	Olcott Farm	1921	950	Drl	180	70	6	70?	Sandstone and shale	50	....	Acl	Water contains mud, slime, oil, and natural gas.
Cm 78	12M, 7.1S, 10.3W	do.	1937	950	Drl	68	67	6	67	do.	....	....	Ab	
Cm 79	12M, 7.1S, 10.3W	do.	1930	950	Drl	150	....	6	....	do.	....	....	Ad	Water contains slime and has high iron content; requires filtration before use.
Cm 80	12M, 7.1S, 10.3W	do.	....	950	Dug	53	....	36	....	Gravel	6	....	Al	Water level below suction level during dry period in 1935. (b).
Cm 81	12M, 7.7S, 10.9W	U. S. Government	1941	900	Drl	38	....	6	....	do.	6–18	50	Cs	Well yielded 50 gpm for 24 hrs. (a). (b).
Cm 82	12M, 8.4S, 11.2W	Sun Oil Co.	....	905	Drl	125	73	6	73	Sandstone and shale	22	10	Cs	Drawdown 120 ft after pumping 10 gpm for 1 hr. (a).
Cm 83	12M, 12.0S, 3.5E	Wallace P. Dailey	....	1,480	Dug	21	....	30	....	Gravel?	6.4 8–29–46	....	Al	Weekly water-level measurements begun 9–29–46 by U. S. Geol. Survey, Albany.
Cm 84	12M, 12.6S, 2.4E	Remington Rand, Inc.	....	850	Drl	257	....	8	....	..	17.2 8–13–51	....	UI	Weekly water-level measurements begun 5–20–47 by U. S. Geol. Survey, Albany.
Cm 85	12M, 11.6S, 6.4W	Lawrence M. Dunbar	1936	880	Drl	52	....	6	....	Gravel	21	30	H	
Cm 86	12M, 11.7S, 6.9W	W. E. Murdock, Jr.	1949	920	Drl	40	....	6	....	do.	13	....	H	(a).
Cm 87	12M, 11.8S, 8.1W	W. H. Thomas	....	1,320	Dug	5.8	....	36	....	..	4	....	Adl	
Cm 89	12M, 12.0S, 9.0W	Raymond Nichols	1948	1,140	Drl	128	....	6	....	..	....	....	....	Well yielded salt water and natural gas. Well abandoned.
Cm 90	12M, 12.0S, 9.0W	do.	....	1,140	Dug	23	....	36	....	..	14	5	H	
Cm 91	12M, 12.2S, 9.6W	William Bowes	....	1,320	Dug	16	....	36	....	..	13	....	H	
Cm 92	12M, 11.5S, 9.7W	Ned Schusted	1941	1,530	Drl	52	50	6	....	Sand	Flows	1	Adl	Static water level 8 ft above surface when drilled.
Cm 93	12M, 11.2S, 9.8W	Joseph Hofbauer	1941	1,660	Drl	50	15	6	12	Sandstone and shale	8	5	Al	Well yielded 5 gpm for 10 hrs. (a).
Cm 94	12M, 11.2S, 9.8W	do.	....	1,660	Dug	18	....	36	....	..	12.0 8–1–49	....	Adl	
Cm 95	12M, 9.0S, 11.2W	Mark Maynard	....	890	Drl	39	14	5	7	Sandstone and shale	4	....	Adl	
Cm 96	12M, 9.0S, 10.6W	Howard Gridley	1924	900	Drl	128	7±	6	....	do.	....	....	H	
Cm 97	12M, 9.5S, 10.6W	Kenneth Grossman	....	1,160	Dug	18	....	36	....	..	11.0 8–1–49	....	H	
Cm 98	12M, 11.3S, 10.9W	Richard A. Jackson	....	1,720	Dug	18	....	36	....	..	8.0 8–1–49	....	H	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 99	12M, 11.9S, 10.4W	Ralph Allen	....	1,620	Dug	17	....	36	.....	..	11.5 8–1–49	....	U	
Cm 100	12M, 11.9S, 10.4W	do.	1942	1,600	Drl	180	150	6	....	Sandstone and shale	....	....	Adl	
Cm 101	12M, 12.7S, 8.9W	Frederick Bower	1947	1,720	Drl	145	18	6	12	do.	10	7	Adl	
Cm 102	12M, 13.0S, 9.4W	Frank H. Wagner	....	1,624	Drl	130	100	6	....	do.	....	½	Adl	
Cm 103	12M, 13.0S, 9.4W	do.	....	1,625	Dug	38	....	36	....	..	6	....	U	
Cm 104	12M, 12.2S, 10.8W	W. S. Bailey	....	1,380	Dug	15	....	36	....	..	12	....	H	
Cm 105	12M, 12.3S, 10.0W	Byron Miller	....	1,360	Dug	20	....	36	....	..	10	....	Adl	
Cm 106	12M, 13.6S, 9.8W	Raymond Schmidt	1948	1,725	Drl	140	20	6	8	Sandstone and shale	60	50	Al	Drawdown 20 ft after pumping 50 gpm for 1 hr.
Cm 107	12M, 13.6S, 9.8W	do.	....	1,725	Dug	15	....	36	....	..	11.5 8–2–49	....	H	
Cm 108	12M, 12.3S, 6.5W	Robert Haines	1947	1,500	Drl	124	6	6	6±	Sandstone and shale	20	5	H	
Cm 109	12M, 12.8S, 7.4W	C. L. Northrup	1948	1,700	Drl	130	60	6	58	do.	..	6	Adl	
Cm 110	12M, 12.7S, 8.2W	William T. Lohrke	1946	1,620	Drl	130	20	6	15	do.	20	12	Adl	
Cm 111	12M, 12.8S, 9.9W	Owen Hofbauer	1937	1,660	Drl	88	5	6	....	do.	3	....	Adl	
Cm 112	12M, 12.8S, 9.9W	do.	....	1,660	Dug	15	....	36	....	..	5.5 8–3–49	....	Al	
Cm 113	12M, 10.5S, 10.7W	Mary Root	....	1,710	Dug	17	....	36	....	..	9	....	Adl	
Cm 114	12M, 13.5S, 11.3W	Alfred Pock	....	810	Dug	27	....	36	....	..	24	....	H	Well dry 5 days in 1949.
Cm 115	12M, 13.1S, 10.8W	Melvin Cady	....	1,705	Drl	64	64	6	....	..	..	½	Adl	
Cm 116	12M, 14.3S, 9.8W	Walter L. Bower	1939	1,400	Drl	118	....	6	40	Sandstone and shale	50	3	Acdl	
Cm 117	12M, 14.3S, 9.8W	do.	....	1,400	Dug	40	....	....	....	..	2	....	UA	
Cm 118	12M, 16.3S, 7.7W	Grange League Federation Service Coop., Inc., of Seely Creek	1948	1,040	Drl	58	....	6	....	Sand	10	30	Is	Water contains hydrogen sulfide.
Cm 119	12M, 16.0S, 8.4W	Fred Gay	....	1,110	Dug	19	....	36	....	..	10	....	Adl	
Cm 120	12M, 14.6S, 9.5W	Richard Sawyer	....	1,365	Dug	10	....	36	....	..	5.3 8–4–49	....	H	Flow of nearby spring is piped into well.
Cm 121	12M, 15.1S, 9.9W	Wesley Lovell	....	1,585	Drl	85	22	6	20	Sandstone and shale	14.5 8–4–49	....	H	(a).
Cm 122	12M, 15.3S, 9.8W	Russell Snowberg	....	1,585	Dug	8	....	36	....	..	3.2 8–4–49	....	Al	Water level about 6 in. above surface 8 months of year. (a).
Cm 123	12M, 15.8S, 9.7W	Wayne Wright	....	1,180	Dug	17	....	36	....	..	15.5 8–4–49	....	Adl	Water has disagreeable taste in spring of year.
Cm 124	12M, 15.7S, 11.2W	Walter D. Jerzak	1942	1,300	Drl	208	197	6	196	Sandstone and shale	50	8	H	
Cm 125	12M, 14.6S, 11.2W	Charles Gotham	....	1,495	Dug	10	....	36	....	..	9	....	H?	Temp. 55°F, 8–4–49 (meas.).
Cm 126	12M, 14.0S, 10.7W	Edward Rozell	....	1,665	Dug	19.4	....	36	....	..	12.8 8–4–49	....	H	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 127	12M, 16.6S, 10.8W	L. B. White	....	1,720	Dug	20	....	36	....	..	19.4 8-4-49	....	H	
Cm 128	12M, 17.3S, 10.8W	Raymond Horton	....	1,560	Dug	16	....	36	....	..	12.5 8-4-49	....	Adl	
Cm 129	12M, 17.2S, 10.3W	Edward Olds	....	1,760	Drl	85	....	6	....	Sandstone and shale	1	....	H	Noticeable increase in hardness during dry weather.
Cm 130	12M, 16.6S, 9.7W	R. Buchanan	....	1,720	Dug	11	....	....	....	..	8	....	H	
Cm 132	12M, 6.0S, 3.4W	Village of Horseheads	1946	895	Drl	51	41	18	....	Sand and gravel	5.5 5-16-54	996	M	Finished with 10-ft length of 18-in.-diameter screen. Drawdown about 7 ft after pumping. (a) (b).
Cm 133	12M, 5.6S, 2.6W	J. Livens	1951	960	Drl	102	65	5	62	Sandstone and shale	40	5	H	
Cm 134	12M, 4.3S, 3.3W	D. B. Evans	1951	925	Drl	35	35	6	....	Gravel	10	8	H	
Cm 135	12M, 3.7S, 2.4W	Arthur Campbell	1951	1,145	Drl	84	63	6	....	Sandstone and shale	35	5	H	
Cm 136	12M, 3.3S, 1.8W	A. Lubnow	1950	1,100	Drl	104	102	6	100	do.	Flows	25+	H	Pumping level 30 ft when pumped at 25 gpm.
Cm 137	12M, 1.4S, 3.8W	Adelbert Paris	1948	975	Drl	105+	105	6	....	Sand	8	35+	H	
Cm 138	12M, 0.9N, 3.2W	Banks and Lant	....	1,070	Dug	14	14	36	....	Gravel	7	....	Adl	
Cm 139	12M, 0.3S, 2.8W	Frank E. Conklin	....	1,295	Drl	120	22	6	20	Sandstone and shale	15	15	Adl	(a).
Cm 140	12M, 1.5S, 3.0W	H. E. Rogers	1947	1,215	Drl	140	17	6	15	do.	40	7	H	
Cm 141	12M, 1.1S, 1.7W	Charles Everetts	....	1,250	Dug	10	10	30	....	..	6.5 10-17-51	....	H	
Cm 142	12M, 0.4S, 1.0W	W. K. Hamlin	1941±	1,480	Drl	136	40	6	....	Sandstone and shale	70	8	Adl	
Cm 143	12M, 1.4S, 0.8W	D. F. Torpy	1950	1,175	Drl	23	23	6	....	Gravel and sand	17	6	H	(b).
Cm 144	12M, 1.1S, 0.7W	Judd Parrott, Sr.	1951	1,220	Drl	59	58	6	58	Sandstone and shale	6	1½	H	
Cm 145	12M, 2.6S, 1.1W	Raymond Forsythe	....	1,080	Drv	32	....	1¼	....	..	20±	....	H	Finished with drive point.
Cm 146	12M, 2.0S, 0.2W	A. J. Hulett, Jr.	1950	1,120	Drl	51	51	6	....	Sand and gravel	15	40	H	(b).
Cm 147	12M, 0.3S, 0.1E	Elmer Conkrite	....	1,380	Drl	103	75	6	70	Sandstone and shale	46	6	Adl	
Cm 148	12M, 0.1N, 0.8W	W. J. Garrecht	1951	1,600	Drl	113	74	6	70	do.	64	3	H	(b).
Cm 149	12M, 2.1N, 2.7W	S. C. Jaynes	....	1,440	Drl	72	....	6	....	..	62	5±	Adl	
Cm 150	12M, 2.8N, 2.1W	James Wood	....	1,400	Drv	26	....	1¼	....	..	Flows	....	H	Finished with drive point.
Cm 151	12M, 1.8N, 2.3W	Frank & William Tuma	....	1,480	Drl	223	....	6	216	Sandstone and shale	100	....	Adl	
Cm 152	12M, 2.4N, 2.3W	H. Bennett	....	1,560	Drl	120	4	6	1	do.	30	....	Adl	
Cm 153	12M, 0.7N, 2.1W	George Acker	1918	1,480	Drl	175	....	6	8	do.	35	....	Adl	Well drilled in bottom of dug well.
Cm 154	12M, 0.2N, 2.7W	Charles Samson	1944	1,290	Drl	85	12	6	10	do.	..	....	H	
Cm 155	12M, 0.3N, 3.7W	Owen Gartland	....	1,110	Drl	189	90	6	89	do.	83	....	Adl	(a).
Cm 156	12M, 3.1S, 3.2W	T. F. Berry	1948	980	Drl	110	20±	6	....	do.	..	6	H	
Cm 157	12M, 1.9S, 3.0W	G. A. Turner, Jr.	1948	1,085	Drl	125	18	6	15	do.	35	14	H	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 158	12M, 0.8S, 3.7W	D. L. Hood	1951	980	Drv	20	....	1½	....	..	13	3	H	Well is in cellar. Finished with drive point.
Cm 159	12M, 0.2S, 4.6W	A. W. McDonald	....	960	Dug	13	....	36	....	Gravel	7	....	H	
Cm 160	12M, 2.0S, 1.7W	W. P. Quinn	....	1,270	Drl	125±	12	6	9	Sandstone and shale	10	11	H	
Cm 161	12M, 4.1S, 3.9W	John B. Worstell	1951	940	Drl	52	....	6	....	..	38	4	H	
Cm 162	12M, 0.7N, 0.9W	Harry E. Harvey	....	1,730	Dug	22±	....	48	....	..	10	....	Adl	
Cm 163	12M, 2.6N, 1.2W	Andrew Bubacz	....	1,680	Dug	25	....	36	....	Gravel	11	....	Adl	
Cm 165	12M, 2.7N, 3.2W	Almon Kent	....	1,420	Dug	8	....	36	....	..	7.2 10–20–51	....	H	
Cm 166	12M, 1.3N, 3.3W	John P. Janowski	....	1,100	Drl	161	15	6	15	Sandstone and shale	11	....	H	
Cm 168	12M, 2.6N, 0.7E	Clark Johns	1943±	1,270	Drl	42	34	6	31	do.	Flows	....	H	
Cm 169	12M, 0.6N, 0.6E	Rexford Ostrander	1951	1,600	Drl	59	14	6	12	do.	Flows	5	H	
Cm 170	12M, 4.8S, 5.1W	Thomas Rooney	1943	1,025	Drl	83	80	6	80	do.	30	5	H	Water has high iron content.
Cm 171	12M, 5.9S, 4.6W	H. J. Parsons	1950	935	Drl	22	22	6	....	Gravel	10	22	H	
Cm 172	12M, 5.1S, 4.1W	L. S. VanGorder	1944±	1,020	Drl	125	63	6	60	Sandstone and shale	40±	6	Adl	Well yielded small amount water at depth of 65 ft.
Cm 173	12M, 4.5S, 5.0W	George C. Miller	1950	1,130	Drl	91	14	6	12	do.	25	9	H	(b).
Cm 174	12M, 3.9S, 4.5W	George F. Horton	1950	920	Drl	80	20	6	16	do.	16	7	H	Well yielded 1 gpm at 34 ft. Water contains hydrogen sulfide and natural gas.
Cm 175	12M, 3.8S, 3.3W	Dean Baylor	1950	940	Drl	44	44	6	....	Gravel	39	9	H	(b).
Cm 176	12M, 2.4S, 4.1W	Delos R. Dann	....	960	Drl	38	38	6	....	do.	20	10+	Adl	
Cm 177	12M, 1.9S, 4.1W	L. M. Dann, Sr.	1932	980	Drl	57	57	6	....	do.	10	10+	Adl	Supplies 2 houses.
Cm 178	12M, 7.8S, 1.4W	Quentin Weisbrod	1950	1,160	Drl	48	39	5	36	Sandstone and shale	24	8	H	(b).
Cm 179	12M, 8.7S, 1.7W	James May	....	1,440	Dug	5	5	30	....	..	2.5 10–22–51	....	Adl	
Cm 180	12M, 9.6S, 1.3W	John F. Madigan	....	1,400	Drl	137	20	6	18	Sandstone and shale	..	5	H	
Cm 181	12M, 10.0S, 1.5W	Harold May	1945	1,360	Drl	165	100	6	100	do.	50	8	H	
Cm 182	12M, 10.1S, 1.6W	Arthur May	1950	1,360	Drl	164	100	6	100	do.	40	20	H	
Cm 183	12M, 5.5S, 5.5W	J. R. Coon	1951	940	Drl	45	....	6	....	Gravel	40	7	H	Declining water level necessitated deepening well in 1953.
Cm 184	12M, 4.9S, 6.1W	Adair F. Tobias	....	980	Drl	118±	....	6	....	Sandstone and shale	28	15±	Adl	
Cm 185	12M, 5.0S, 7.0W	W. J. Fridie	1951	980	Drl	45	45	6	....	Gravel	19	30	H	(a).
Cm 186	12M, 5.7S, 7.4W	Corning Glass Works	1949	950	Drl	79	69	6	....	Gravel and sand	22.7 10–22–51	680±	Cs	Finished with 10-ft length of 6-in. diameter screen.
Cm 187	12M, 6.0S, 6.4W	Glenn Banfield	....	980	Drl	60	60	6	....	do.	54	5+	H	
Cm 188	12M, 6.3S, 7.6W	Chemung County	....	940	Drl	60	....	6	....	Gravel	45	27	Cas	
Cm 189	12M, 0.6N, 8.2W	Edson J. Austin	1951	1,620	Drl	26	24	5	24	Sandstone and shale	14	8	H	(b).

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 190	12M, 0.6N, 9.0W	Frederick Michaud	....	1,800	Drl	96	10	6	10	Sandstone and shale	26	....	H	(a).
Cm 191	12M, 0.8S, 8.9W	Edward Scriven	....	1,740	Dug	21	21	36	....	..	15.9 10–23–51	....	H	
Cm 192	12M, 2.4S, 8.0W	Mott Westlake	....	1,200	Drl	39	....	6	8	Sandstone and shale	1	11	H	
Cm 193	12M, 3.2S, 7.1W	William Narsh	1950	1,060	Drl	39	38	6	....	..	34	10	CD	
Cm 194	12M, 4.1S, 7.4W	Friend M. Cramer	1951	1,020	Drl	93	17	6	15	Sandstone and shale	Flows	3	H	(a) (b).
Cm 195	12M, 4.5S, 6.4W	Charles W. Locke	1951	1,015	Drl	68	32	6	30	do.	Flows	8	H	
Cm 196	12M, 4.6S, 6.5W	Orland M. Barnes	1930±	1,010	Drl	74	12	6	10	Sandstone and shale	10	10	H	
Cm 197	12M, 3.3S, 6.0W	Charles Stuck, Jr.	1951	1,300	Drl	64	37	6	35	do.	0.5 10–24–51	10	H	
Cm 198	12M, 3.9S, 5.8W	Walter F. Teller	1946	1,320	Drl	70	10	6	9	do.	0	15	UA	
Cm 199	12M, 3.8S, 5.7W	do.	....	1,320	Drl	72	10	6	9	do.	16	2	H	
Cm 200	12M, 3.0S, 5.6W	John Lattin	1949	1,375	Drl	100	8	6	6	do.	25	5+	H	
Cm 201	12M, 3.1S, 5.3W	James R. McChesney	1950	1,300	Drl	64	64	6	....	Gravel	6	3	H	
Cm 202	12M, 0.1S, 6.1W	Albert M. Dunn	....	1,500	Drl	50	15	6	....	Sandstone and shale	25	....	H	
Cm 203	12M, 1.2S, 5.8W	Robert D. Vedder	....	1,350	Drl	108	18	6	16	do.	29	20+	Adl	
Cm 205	12M, 0.2N, 7.3W	Archie Sawdey	....	1,620	Drl	87	38	6	37	Sandstone and shale	20	....	Adl	
Cm 206	12M, 2.4N, 8.2W	Lloyd Isbell	1951	1,720	Drl	120	10	6	8	do.	50±	10+	H	
Cm 207	12M, 1.7N, 7.4W	Harry Hill	....	1,190	Drv	32	32	1¼	....	..	6	....	H	Water contains hydrogen sulfide. Well finished with drive point.
Cm 208	12M, 2.8N, 7.4W	David R. Shoemaker	1941±	1,220	Drl	56	....	6	Close	..	36	5	H	Yield inadequate in 1951.
Cm 209	12M, 0.9N, 5.9W	Town of Catlin	....	1,055	Drl	60	....	6	10	Sandstone and shale	4	....	Cs	School supply well. Water contains hydrogen sulfide.
Cm 210	12M, 1.5N, 6.7W	Donald Earle	....	1,060	Drv	17	....	1¼	....	Sand	3	....	H	Finished with drive point.
Cm 211	12M, 0.6N, 5.2W	Charles Deyo	....	1,000	Drl	62	....	6	....	Sandstone and shale	15	10	H	
Cm 212	12M, 1.3N, 5.2W	Arthur W. Cook	....	1,080	Dug	28	....	30	....	..	22	....	UH	Well abandoned because of contamination. Many small springs nearby.
Cm 213	12M, 0.4N, 7.5W	James Webb	1943	1,610	Drl	95	70	6	63	Sandstone and shale	10	10	H	Well redrilled 1950; casing set 5 feet deeper.
Cm 214	12M, 0.9S, 6.7W	John Cummins	....	1,560	Dug	20	20	36	....	Clay	10.6 10–25–51	....	Adl	
Cm 215	12M, 0.8S, 7.2W	Myron Osborn	1941	1,480	Drl	94	70±	6	70±	Sandstone and shale	12	10±	H	Water contains hydrogen sulfide.
Cm 216	12M, 1.7S, 6.9W	John L. Murphy	....	1,260	Dug	12	12	40	....	Clay	6	....	H	
Cm 217	12M, 1.3S, 8.0W	Ben Willis	1932	1,400	Drl	3,180	140	10	140±?	..	Flows	....	....	Abandoned gas prospect.
Cm 218	12M, 1.2S, 7.9W	do.	....	1,440	Dug	80?	80?	60	80	..	65	....	H	Well bottomed on rock.
Cm 219	12M, 0.1S, 8.1W	Herbert Webb	....	1,700	Dug	45	25	36	25	Sandstone and shale	33	....	H	
Cm 220	12M, 1.5S, 8.8W	Oscar Powell	1951	1,380	Drl	123	....	6	83	do.	25	9	H	(b).

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 221	12M, 1.9S, 10.1W	Albert Braun	1946	1,755	Drl	108	78	6	77	Sandstone and shale	15±	5+	H	(b).
Cm 222	12M, 1.6S, 9.5W	Edgar Wilcox	....	1,780	Dug	26	26	36	....	..	13	....	Adl	
Cm 223	12M, 9.5S, 3.7W	Hardinge Bros., Inc.	1951	860	Drl	60	....	6	....	Sand	8.5 10–27–51	72	Ic	Water contains hydrogen sulfide. (b).
Cm 224	12M, 3.4S, 7.9W	Manville F. Smith	....	1,320	Drl	90	86	6	84	Sandstone and shale	36	4	H	
Cm 225	12M, 3.5S, 11.1W	James Boncer	....	1,700	Drl	78	10	8	5	do.	57	1	H	
Cm 226	12M, 4.8S, 8.8W	Edward Adams	....	1,350	Dug	26	26	36	....	..	9.4 10–27–51	....	Adl	
Cm 227	12M, 3.6S, 8.8W	James Monighan	....	1,450	Dug	10	10	36	....	..	7.0 10–27–51	....	H	
Cm 228	12M, 4.7S, 10.1W	Percy Palmer	1949	1,485	Drl	184	144	6	144	Sandstone and shale	40	7½	H	Water has high iron content.
Cm 229	12M, 5.9S, 9.1W	Norman Evenden	1947	1,010	Drl	45	....	6	....	..	Flows	....	H	Water contains hydrogen sulfide.
Cm 230	12M, 6.2S, 10.5W	Lawrence Wilkins	1949	1,080	Drl	31	30	5	30	Sandstone and shale	12	5	H	
Cm 231	12M, 5.1S, 10.4W	Alford Thomas	1950	1,320	Drl	91	90	6	88	do.	Flows	3½	H	(b).
Cm 232	12M, 4.6S, 11.2W	W. H. Krener	....	1,680	Dug	10	10	36	10	..	6	....	H	Water contains hydrogen sulfide. Well bottoms on rock.
Cm 233	12M, 6.5S, 10.5W	Walter Mitstifer	1950	1,040	Drl	55	10	5	9	Sandstone and shale	6	3	H	(b).
Cm 234	12M, 6.8S, 10.2W	John Benyo, Sr.	1948	980	Drl	57	57	6	....	Gravel	12	15	H	
Cm 236	12M, 8.2S, 9.0W	B. A. Goss	....	900	Drv	22	....	1¼	....	..	13	....	Adl	Finished with drive point.
Cm 237	12M, 7.5S, 7.9W	Rowland W. Farr	1925±	935	Drl	100	22	6	20	Sandstone and shale	6	....	Adl	Water contains natural gas.
Cm 238	12M, 7.6S, 8.2W	James E. Farr	....	915	Dug	14	....	36	....	..	11.5 10–30–51	....	H	
Cm 239	12M, 7.1S, 7.3W	Leland Canfield	....	960	Drl	64	32	6	30	Sandstone and shale	30	8	H	
Cm 240	12M, 7.7S, 10.2W	Leo Griswold	....	920	Drv	24	....	1¼	....	Clay	14	....	H	Finished with drive point.
Cm 241	12M, 1.3N, 9.5W	Winnie W. Becraft	....	1,340	Dug	25	25	36	....	Gravel	..	....	H	(a).
Cm 242	12M, 1.7N, 9.6W	Chester DeMun	....	1,400	Drl	75	20	6	10	Sandstone and shale	15	8	Adl	
Cm 243	12M, 2.7N, 9.1W	Harry W. Rice	....	1,660	Drl	80±	....	6	....	do.	Flows	....	Adl	
Cm 244	12M, 0.8N, 10.7W	Earle B. Lewis	....	1,220	Drl	35	35	6	....	Gravel	..	10	H	
Cm 245	12M, 2.4N, 10.7W	Charles Terry	1944	1,250	Drl	66	....	6	....	..	10	....	Adl	
Cm 246	12M, 0.6S, 10.7W	Clyde D. Bucher	1944	1,200	Drl	65	65	6	....	Sand and gravel	37	5	Adl	
Cm 248	12M, 1.0S, 9.8W	Frank Barber	....	1,700	Dug	22	22	30	22	..	18	....	H	Well bottomed on rock.
Cm 249	12M, 7.0S, 9.1W	Charles S. Wolcott Est.	1918	920	Drv	32	....	1¼	....	..	2	....	Adl	Finished with drive point.
Cm 250	12M, 8.5S, 7.4W	W. K. Merrill	1946	1,600	Drl	145	82	6	80	Sandstone and shale	20	3	H	
Cm 251	12M, 8.6S, 7.5W	County of Chemung	1936	1,699	Drl	186	6	6	5	do.	..	25	Cds	
Cm 252	12M, 8.4S, 7.7W	do.	1938	1,675	Drl	500	6	6	5	do.	90	50	Cs	
Cm 253	12M, 8.5S, 7.5W	do.	1938	1,665	Drl	116	6	6	5	do.	..	25	Cs	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 254	12M, 10.2S, 5.5W	M. E. Murdock	1951	1,400	Drl	130	17	6	16	Sandstone and shale	20	7	H	(b).
Cm 255	12M, 11.2S, 4.7W	County of Chemung	1944	980	Drl	250	6	6	5	do.	90	6	UC	
Cm 256	12M, 11.2S, 4.6W	do.	....	980	Drl	150	....	6	....	do.	60	....	UC	
Cm 257	12M, 11.8S, 7.0W	Garth Swingle	1950	920	Drl	97	22	6	20	do.	0–16	9	H	Water level is at surface in spring of year. (a) (b).
Cm 258	12M, 11.7S, 7.0W	Shelanskey's Greenhouse	1944	910	Drl	108	47	6	45	do.	16	10+	Ai	
Cm 259	12M, 11.7S, 7.0W	do.	....	910	Drl	50	45	6	45	do.	25	5	Ai	
Cm 260	12M, 13.7S, 5.9W	Fred Van Dressen	1951	1,200	Drl	60	22	6	20	do.	10	6	H	
Cm 261	12M, 13.4S, 5.9W	Arnold Sowers	1951	1,380	Drl	113	103	6	102	do.	27	5	H	(b).
Cm 262	12M, 16.3S, 2.8W	Frederick Stadelmaier	1951	1,120	Drl	69	53	6	52	do.	20	3	H	(a) (b).
Cm 263	12M, 15.6S, 2.6W	James Strickland	1951	1,090	Drl	103	103	6	....	Gravel	40	10	H	(a) (b).
Cm 264	12M, 16.5S, 2.0W	Murray Van Dyke	1950	1,160	Drl	72	....	6	....	..	Flows	....	H	
Cm 265	12M, 16.5S, 0.9W	Carlton Smith	1950	1,660	Drl	92	11.3	6	10	Gravel	40	6	H	Well penetrates bedrock between depths of 10 and 91 ft. At 91 ft drill entered gravel. (b).
Cm 266	12M, 7.8S, 3.9W	Callear Greenhouse	1950	890	Drl	32	32	6	....	do.	14	10	Ai	(a) (b).
Cm 267	12M, 8.5S, 3.2W	Elmira Floral Products Co., Inc.	1949	860	Drl	42	32	8	32	Sandstone and shale	18	20	Cc	
Cm 268	12M, 11.2S, 1.1W	George Mausteller	1947	1,330	Drl	75	21	6	18	do.	10	4	H	(b).
Cm 269	12M, 11.3S, 1.0W	Albert Packard	1950	1,320	Drl	48	42	6	40	do.	10	12	H	(b).
Cm 270	12M, 11.5S, 5.5W	Harold L. Walworth	....	920	Drl	248	99	6	90	do.	39	10	H	(b).
Cm 271	12M, 6.3S, 4.7W	Westinghouse Elect. Corp.	1951	904	Drl	45	....	12	....	Gravel	12	390	Ics	Drawdown 6 ft after pumping 390 gpm for 6 hrs. Finished with screen.
Cm 272	12M, 6.3S, 4.6W	do.	1951	904	Drl	45	....	6	45	do.	..	....	Ics	Finished with screen. Well bottomed on rock. (a) (b).
Cm 273	12M, 15.5S, 2.2E	Vance Hamel	1948	820	Drl	190	72	6	70	Sandstone and shale	35	10+	H	
Cm 274	12M, 15.3S, 1.9E	J. C. Knapp	1920	820	Drl	135	130	6	128	Sandstone and shale	..	20	Adl	
Cm 275	12M, 13.8S, 2.3E	Marvin Wright	....	900	Dug	15	15	36	....	..	7	....	H	
Cm 276	12M, 13.4S, 2.6E	A. Vetter	1950	1,020	Drl	115	109	6	109	Sandstone and shale	Flows	7	H	Well flows 3 gpm. (b).
Cm 277	12M, 11.1S, 5.1E	James L. Brown	1944	1,140	Drl	69	27	6	25	do.	Flows	8+	H	Well flows 8 gpm. Water contains hydrogen sulfide.
Cm 278	12M, 11.1S, 3.3E	Verna Jerzak	1948	1,285	Drl	122	74	5	73	do.	35	18	H	
Cm 279	12M, 11.0S, 2.8E	Lloyd Taylor	1947	1,050	Drl	156	40	6	35	do.	50	....	H	
Cm 280	12M, 10.7S, 2.9E	Richard Fleming	1943	1,010	Drl	47	35	6	27	do.	12	25+	H	
Cm 281	12M, 10.1S, 2.9E	Clifford Laun	....	1,020	Drl	80	....	6	....	..	4.2 11–9–51	....	U	Water contains hydrogen sulfide and natural gas.
Cm 282	12M, 11.0S, 2.7E	Charles M. Whitaker	1946±	1,000	Drl	67	51	6	50	Sandstone and shale	3	11	Cs	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 283	12M, 11.5S, 2.0E	Donald Hugg	....	980	Drl	53	47	6	46	Sandstone and shale	25	3	H	(b).
Cm 284	12M, 12.5S, 0.6E	Ralph Kabes	1948	928	Drl	45	25	6	23	do.	20	12	H	
Cm 285	12M, 11.5S, 0.6E	George Bridgeman	1950	1,160	Drl	75	30±	6	....	do.	30	10+	H	
Cm 286	12M, 10.6S, 0.2E	Henry A. Draht	....	1,240	Drl	100	20	6	18	do.	80	....	Adl	
Cm 287	12M, 9.8S, 0.4E	Joseph W. Rhode	....	1,480	Drl	140	5	6	0	do.	85	10+	Adl	
Cm 288	12M, 9.5S, 0.9E	Louise Macek	1929	1,550	Drl	108	5	6	3	do.	73	5	Adl	
Cm 290	12M, 9.7S, 1.9E	Joseph Ontl	1941±	1,460	Drl	139	50	6	49	do.	100+	....	Adl	
Cm 291	12M, 9.7S, 1.5E	Earl Harrington	1946	1,300	Drl	77	22	6	10	do.	24	15+	Adl	
Cm 292	12M, 14.2S, 1.4E	Leon Bartlett	....	880	Drl	100	90	6	88	do.	30	....	Adl	Water contains hydrogen sulfide.
Cm 293	12M, 11.8S, 1.7W	U. S. Government	1951	843	Drl	20	20	12	....	Gravel	13	270	O	Drawdown 6 ft when pumped at 272 gpm. Well is cased with perforatedpipe from 12 to 20 ft. Used to dewater foundation of dike. (b).
Cm 294	12M, 11.9S, 1.6W	do.	1951	843	Drl	28	28	12	....	do.	13	950	O	Drawdown 4 ft when pumped at 950 gpm. Well cased with perforated pipe from 12 to 28 ft. Used to dewater foundation of dike.
Cm 295	12M, 12.0S, 1.6W	do.	1951	842	Drl	26	26	12	....	do.	13	200	O	Drawdown 6 ft when pumped at 196 gpm. Well cased with perforated pipe from 12 to 26 ft. Used to dewater foundation of dike.
Cm 296	12M, 12.0S, 1.6W	do.	1951	842	Drl	25	25	12	....	do.	13	275	O	Drawdown 6 ft when pumped at 274 gpm. Well cased with perforated pipe from 12 to 25 ft. Used to dewater foundation of dike.
Cm 297	12M, 12.1S, 1.6W	do.	1951	844	Drl	25	25	12	....	do.	15	195	O	Drawdown 6 ft when pumped at 193 gpm. Well cased with perforated pipe from 12 to 25 ft. Used to dewater foundation of dike.
Cm 298	12M, 12.1S, 1.5W	do.	1951	843	Drl	25	25	12	....	do.	14	240	O	Drawdown 6 ft when pumped at 240 gpm. Well cased with perforated pipe from 12 to 25 ft. Used to dewater foundation of dike. (b).
Cm 299	12M, 12.1S, 1.5W	U. S. Government	1951	843	Drl	24	24	12	....	Gravel	13	....	O	Well cased with perforated pipe from 12 to 24 ft. Used to dewater foundation of dike.
Cm 300	12M, 12.2S, 1.5W	do.	1951	845	Drl	24	24	12	....	do.	13	....	O	do.
Cm 301	12M, 13.8S, 4.3W	Robert Edsall	....	910	Drl	145	145	6	....	Sand	6	30+	H	(b).
Cm 302	12M, 13.6S, 4.8W	Clarence W. Crandall	1951	980	Drl	93	62	6	60	Sandstone and shale	40	50	H	(a) (b).
Cm 303	12M, 13.5S, 4.9W	Town of Southport	1951	1,020	Drl	278	31	6	26	do.	..	7½	Cs	(b).
Cm 304	12M, 14.9S, 6.2W	Richard A. Baker	1950	1,000	Drl	130	108	6	102	do.	35	30+	H	(a) (b).
Cm 305	12M, 15.4S, 6.8W	Clem Shope	....	1,005	Drl	107	107	6	....	Sand	15	30	H	(a) (b).
Cm 306	12M, 11.0S, 7.3W	Jacob Bennett	....	890	Drl	42	42	6	....	do.	15	30	H	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 307	12M, 5.6S, 4.0W	Consolidated Brick Co.	1951	910	Drl	48	48	6	....	Sand and gravel	20	10	UI	(b).
Cm 308	12M, 7.1S, 2.7W	Arthur C. Schneck	1951	915	Drl	189	53	6	50	Sandstone and shale	30	3½	H	(b).
Cm 309	12M, 7.0S, 2.8W	W. J. Fraind	1951	910	Drl	150	126	6	124	do.	40	4½	H	Water contains hydrogen sulfide. (b).
Cm 310	12M, 7.9S, 3.3W	Elmer A. Tifft	1944	880	Drl	267	....	6	....	Clay	..	....	UH	Yield insufficient. Well abandoned. (b).
Cm 311	12M, 7.4S, 0.9W	Charles Ettenberger	1948	1,140	Drl	98	50	6	48	Sandstone and shale	Flows	10+	Adl	
Cm 312	12M, 6.3S, 1.0W	Lorenz Bradt	....	1,275	Dug	7	7	40	....	Gravel	1.1 11-13-51	....	H	(a).
Cm 313	12M, 6.7S, 1.4W	A. A. Ochab	....	1,195	Dug	32	30	36	30	Sandstone and shale	10	....	H	
Cm 314	12M, 7.3S, 1.7W	Lenna Sours	1949	1,025	Drl	58	8	6	6	do.	Flows	5	H	Water contains hydrogen sulfide.
Cm 315	12M, 6.7S, 0.4W	Gordon E. Mallory	....	1,575	Drl	160	....	6	6	do.	80±	....	Adl	
Cm 316	12M, 5.8S, 0.3W	Harry J. Forrest	1947	1,420	Drl	165	20	6	Close	do.	40	5	Adl	
Cm 317	12M, 5.4S, 1.7W	Wesley Jones	....	1,245	Drl	102	....	6	....	do.	32	10	H	do.
Cm 318	12M, 5.5S, 2.1W	John E. Schoenhofen	1951	1,040	Drl	104	36	6	30	do.	40	4	H	
Cm 319	12M, 8.0S, 0.3W	Franklin Combs	1942±	1,470	Drl	87	15	6	10	do.	..	....	Adl	
Cm 320	12M, 8.2S, 0.5W	James Cowl	1951	1,480	Drl	98	12	6	8	do.	17	2	H	
Cm 321	12M, 9.2S, 0.6W	Frank Pfeifer	1931	1,240	Drl	150	12	6	10	do.	..	25+	Adl	
Cm 322	12M, 10.6S, 1.3W	Ray Hauver	1948	1,315	Drl	119	....	6	80	do.	8	8	H	
Cm 323	12M, 4.2S, 1.0E	Leslie B. Wager	1951	1,200	Drl	86	56	6	53	do.	15	4	H	(b).
Cm 325	12M, 2.2S, 2.2E	George Abbott	1948	1,400	Drl	80	10	6	6	Sandstone and shale	Flows	8	H	
Cm 326	12M, 1.9S, 1.2E	Clarence Bailey	....	1,510	Dug	49	49	24	....	..	44.4 11-15-51	....	H	Well flows in spring. Water not used for drinking.
Cm 327	12M, 1.7S, 0.2E	Joseph and Charles Kocourek	1940	1,260	Drl	42+	42	6	42	Gravel	20	35+	Adl	
Cm 328	12M, 1.1S, 0.6E	Russell Cummings	1923	1,240	Drl	120	....	6	....	Sandstone and shale	..	10+	Adl	
Cm 329	12M, 1.1S, 1.4E	Theodore W. Eggers	1938	1,280	Drl	....	....	4	....	..	Flows	....	Al	Flows continuously.
Cm 330	12M, 1.8S, 3.9E	Bernard Henning	....	1,480	Dug	18	....	36	....	..	8	3+	Adl	Well was dry in 1942.
Cm 331	12M, 2.1S, 2.9E	Guy S. Morgan	....	1,500	Dug	20	20	36	....	..	5	....	H	
Cm 332	12M, 3.0S, 4.1E	Leon Jaquish	....	1,375	Dug	26	26	30	....	Gravel	15	....	Adl	
Cm 333	12M, 1.2S, 3.8W	Wilbur Dawson	1951	975	Drl	124	56	6	....	do.	23	6	H	(a) (b).
Cm 334	12M, 4.8S, 3.3E	Francis Patterson	1949	1,240	Drl	89	79	6	....	do.	19	5	Cs	(a) (b).
Cm 335	12M, 5.5S, 4.7E	R. D. Millerd	1949	1,370	Drl	46	....	6	43	Sandstone and shale	Flows	5	H	(a).
Cm 336	12M, 5.1S, 6.0E	Ira Matejka	1949	1,725	Drl	75	10	6	8	do.	30	20	H	
Cm 337	12M, 4.5S, 4.1E	James L. Smith	....	1,260	Dug	11	....	36	....	..	8	....	H	
Cm 338	12M, 4.8S, 1.1W	Nancy May	1948	1,010	Drl	35	35	6	....	Gravel	..	25+	H	(a).
Cm 339	12M, 4.5S, 0.7W	John Vargo	....	1,160	Drl	80±	....	6	....	..	12	10+	Ad	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 340	12M, 3.9S, 0.7W	John Vargo	....	1,260	Dug	23	23	36	....	..	8.7 11–17–51	....	Al	(b).
Cm 341	12M, 3.9S, 0.2E	Frank Elliott	....	1,260	Drl	33	....	5	....	Gravel	26	10	Adl	Well was drilled to 39 ft; has filled to 33 ft with sand. Yielded 10 gpm for 4 hrs. Water has high iron content.
Cm 342	12M, 4.9S, 0.3E	F. E. Whitmore	....	1,140	Drl	65	4	6	2	Sandstone and shale	5.2 11–17–51	5	H	
Cm 343	12M, 5.3S, 1.6E	Fred C. Blackwell	1947	1,140	Dug	22	....	24	....	..	19	....	H	Well can be pumped dry with pitcher pump in dry season.
Cm 344	12M, 5.1S, 2.3E	John Cernohorsky	....	1,180	Drl	86	....	6	25	Sandstone and shale	36	5	Adl	
Cm 345	12M, 4.9S, 1.6E	Floyd Wood	1942	1,200	Drl	110	67±	6	65	do.	Flows	10	Adl	(a).
Cm 346	12M, 4.3S, 1.7E	do.	....	1,310	Dug	22	22	36	....	Clay	9	....	Al	
Cm 347	12M, 1.7S, 7.2E	Nina Clark	1950	1,000	Drl	75	10	6	6	Sandstone and shale	20	10	H	
Cm 348	12M, 3.1S, 5.2E	Floyd Drake	....	1,470	Dug	11	11	36	11	..	6.1 11–19–51	....	Adl	Well bottomed on rock.
Cm 349	12M, 3.3S, 4.8E	Leora McKibbin	....	1,400	Drl	132	....	6	....	..	Flows	....	Adl	Water flows to house under artesian pressure.
Cm 350	12M, 2.8S, 0.8W	Raymond Forsythe, Sr.	....	1,060	Drl	300	100	6	....	Sandstone and shale	70±	¾	H	Water contains hydrogen sulfide.
Cm 351	12M, 1.3S, 2.1E	George Zoharian	1951	1,580	Drl	95	28	6	26	do.	30	5	H	
Cm 352	12M, 1.7S, 2.2E	Charles D. Talmadge	1951	1,430	Drl	77	63	5	....	do.	..	4	H	
Cm 353	12M, 15.2S, 3.0W	Adelbert Cobb	1951	1,095	Drl	170	93	6	90	do.	50±	30	H	
Cm 354	12M, 7.2S, 0.1E	E. H. Rouse	....	1,340	Dug	25	25	36	....	..	13.0 6–10–52	....	H	
Cm 355	12M, 6.9S, 0.5E	M. O.Hickman	1951	1,380	Drl	150	11	6	10	Sandstone and shale	..	4	Adl	(a) (b).
Cm 356	12M, 5.6S, 1.1E	Chemung County	....	1,360	Drl	385±	6	6	....	do.	..	200?	Adl	Well supplies county farm and home.
Cm 357	12M, 5.6S, 1.1E	do.	....	1,360	Drl	385±	....	6	....	do.	..	200?	Adl	do.
Cm 358	12M, 1.0N, 6.4W	D. E. Marshall	....	1,060	Drl	78	35±	4	35±	do.	..	4.5	H	Flow increased from 1 gpm to 4.5 gpm after treatment with dry ice.
Cm 359	12M, 6.3S, 1.3E	E. R. Ennis	1949	1,160	Drl	49	49	6	....	Gravel and sand	22	20	H	
Cm 361	12M, 7.8S, 2.5E	Fred Murphy	....	1,190	Dug	20	15	36	....	..	11	....	H	Well in basement.
Cm 362	12M, 8.4S, 2.3E	James Burlew	....	1,080	Dug	15	15	36	....	Sand and clay	6	....	H	
Cm 363	12M, 9.3S, 2.9E	W. L. Skelly	....	1,079	Dug	20	20	30	....	Gravel	12	....	H	
Cm 364	12M, 10.4S 3.0E	Grant N. Pealer, Jr.	1950	1,020	Drl	37	37	6	....	do.	7	10	H	
Cm 365	12M, 7.7S, 1.1E	John Gernak	1949	1,620	Drl	121	31	6	30	Sandstone and shale	43	6	H	
Cm 366	12M, 6.3S, 2.2E	Herbert Staples	....	1,480	Dug	8	8	48	....	do.	Flows	....	Adl	
Cm 367	12M, 5.8S, 3.1E	Charles Wheaton	....	1,660	Drl	158	12	6	10	do.	..	30	Al	earby dug well 8 ft deep supplies domestic needs 9 months of yr.
Cm 368	12M, 4.9S, 3.9E	Charles Walley	1950	1,240	Drl	82	82	6	....	Gravel	3	2.5	H	(a).

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 369	12M, 5.7S, 4.3E	Frank Trefny	....	1,425	Dug	38	38	36	....	..	6.1 6–11–52	....	H	
Cm 370	12M, 6.4S, 4.9E	Elmer Struzinsky	....	1,365	Dug	32	32	36	....	..	4.2 6–11–52	....	H	Well has been dry 3 times since 1934.
Cm 372	12M, 6.8S, 2.9E	do.	....	1,420	Drv	17	17	1¼	....	..	..	....	UH	Finished with drive point. Domestic needs supplied by unimproved springs.
Cm 373	12M, 8.8S, 3.3E	M. H. Little	....	1,260	Dug	25	25	36	....	..	1	....	H	Well bottomed on rock. Well was dry in summers of 1949–51.
Cm 374	12M, 8.2S, 3.7E	Harry Swartwood	....	1,540	Drl	98	40±	6	....	Sandstone and shale	33	5+	H	
Cm 375	12M, 8.3S, 3.0E	Roy Halpin	....	1,340	Dug	22	22	36	....	..	4.4 6–12–52	....	H	
Cm 376	12M, 7.9S, 4.2E	George Mathews	....	1,650	Dug	25±	....	36	....	..	2	....	H	
Cm 377	12M, 9.8S, 3.7E	W. C. Hughes	1948	1,150	Drl	144	55	6	54	Sandstone and shale	Flows	6	H	Water contains hydrogen sulfide.
Cm 378	12M, 5.4S, 0.7E	Horseheads Central School District	1885	1,080	Drl	196	192	6	....	do.	12–14	....	M	Well flowed 1 gpm in 1885; water level 6 ft above land surface in 1910; well stopped flowing 1950. Temperature 62°F in 1885; 50°F, 6–14–56 (meas.). Well supplies school, dry cleaning establishment, and residence. Water bottled and sold as Breesport Oxygenated Spring Water until 1937. (a).
Cm 379	12M, 3.0S, 6.2E	R. S. Mohlar	....	1,680	Dug	24	24	36	24	..	20	....	H	Water level low in dry season. Well bottomed on rock.
Cm 380	12M, 2.1S, 5.5E	Myron W. Houck	....	1,820	Drl	120	20	6	18	Sandstone and shale	50±	....	H	Water has high iron content.
Cm 381	12M, 1.3S, 5.0E	Aino Jarvi	1947	1,660	Drl	98	4	6	3	do.	48	12	Adl	
Cm 382	12M, 1.8S, 5.9E	Michael Louko	....	1,725	Dug	9	9	36	9	do.	4	....	Adl	Well bottoms on rock. Water has high iron content.
Cm 383	12M, 0.9S, 7.2E	Antri Lepikko	....	1,060	Drl	78	....	6	....	..	42	5	UH	Domestic needs furnished by spring .
Cm 384	12M, 1.6S, 7.7E	Leon Ostrander	....	1,060	Dug	21+	21	30	....	..	14.9 6–14–52	....	H	Well goes dry in dry seasons.
Cm 385	12M, 2.7S, 8.6E	John Morton	....	1,020	Drl	65	6	6	....	Sandstone and shale	..	10	H	Nearby spring flows continuously. Temperature of spring water 51°F, 6–14–52 (meas.).
Cm 386	12M, 3.7S, 10.2E	John Sandusky	1951	1,015	Drl	46+	46	6	46+	Gravel	5	30+	H	Well bottoms on rock.
Cm 387	12M, 3.5S, 10.1E	Town of Van Etten	1939	1,010	Drl	80+	80	8	....	Sand and gravel	..	50+	M	(a).
Cm 388	12M, 0.1S, 7.8E	Martin Sandquist	....	1,280	Drl	71	21	6	20	Sandstone and shale	6	15	Adl	
Cm 389	12M, 0.8N, 8.0E	do.	....	1,630	Drl	40	11	6	10	do.	6	....	Ad	Yield sufficient for domestic supply only.
Cm 390	12M, 0.7N, 8.8E	Neal Walle	1945	1,640	Drl	125	40	6	39	do.	40	8	Adl	
Cm 391	12M, 1.3N, 8.8E	Gus Davis	1951	1,660	Drl	74	13	6	12	do.	8	6	Adl	
Cm 392	12M, 0.4N, 9.6E	John Heino	1944	1,540	Drl	118	85	6	84	do.	18	20	Adl	
Cm 393	12M, 0.9N, 9.7E	Holker Kaukinen	1945	1,760	Drl	105	23	6	22	do.	30	5	Adl	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 394	12M, 1.7N, 9.7E	Waino Lampila	1951	1,760	Drl	64	48	6	48	Sandstone and shale	14	14	Adl	Rock 6 ft below surface in nearby excavation.
Cm 395	12M, 2.1N, 9.6E	Everett Lampila	1940	1,803	Drl	50	22	6	17	do.	20	30	Adl	
Cm 396	12M, 0.1S, 9.9E	David Nurmi	1942	1,660	Drl	132	77	6	75	do.	17	4	Adl	
Cm 397	12M, 2.5S, 10.2E	T. M. Clark	....	1,140	Drl	60	7	6	6	do.	Flows	....	Adl	
Cm 398	12M, 1.5S, 10.3E	John Aura	....	1,300	Dug	40	40	36	....	..	10	....	H	
Cm 399	12M, 0.3S, 10.9E	Leander Walle	1942	1,600	Drl	65	12	6	6	Sandstone and shale	30	4	Adl	
Cm 400	12M, 1.4S, 9.4E	Ole Lauritzer	....	1,660	Drl	125	....	6	15	do.	72	....	H	
Cm 401	12M, 2.2S, 9.3E	Frank Cronlund	1934	1,570	Drl	132	10	6	9	Sandstone and shale	66	10	Adl	
Cm 402	12M, 2.9S, 9.2E	R. E. Rumsey	....	1,100	Dug	9	9	24	9	..	6	....	H	Well bottomed on rock. Auxiliary well; used only when nearby spring is low.
Cm 403	12M, 4.2S, 6.0E	Harold Morgan	....	1,560	Dug	28	28	36	....	..	12	5	Adl	
Cm 404	12M, 4.0S, 4.7E	Mary Ennis	....	1,640	Drl	120	5	6	4	Sandstone and shale	20	5±	Adl	
Cm 405	12M, 4.2S, 5.4E	Lawrence Bennett	....	1,470	Dug	19	19	36	....	..	3.5 6–17–52	....	H	
Cm 406	12M, 5.1S, 4.8E	Homer Smith	1950	1,480	Drl	100	24	6	23	Sandstone and shale	4	6	H	
Cm 407	12M, 5.9S, 5.3E	Charles Palmer	....	1,640	Dug	18	4	36	4	do.	2	....	Adl	Well excavated 14 ft into rock by blasting.
Cm 408	12M, 6.7S, 5.6E	Larue Palmer	....	1,560	Dug	13.5	4	48	4	do.	6	....	H	
Cm 409	12M, 7.0S, 5.0E	Rosa Houdek	....	1,680	Drl	45	25	6	24	do.	..	10+	Adl	
Cm 410	12M, 8.1S, 5.0E	John Henley	1946	1,680	Drl	52	6	6	5	do.	34	....	H	Water has high iron content.
Cm 411	12M, 3.6S, 7.9E	Blanch Swartout	....	1,250	Dug	4	4	48	....	..	Flows	....	H	
Cm 412	12M, 3.0S, 8.4E	Richard Russell	....	1,015	Drl	75	15	6	12	Sandstone and shale	15	12	Adl	(a).
Cm 413	12M, 2.3S, 7.8E	William Luuri	....	1,020	Dug	16	16	36	....	Gravel	3	....	Adl	
Cm 414	12M, 3.8S, 8.5E	Isaac Mallula	1951	1,260	Drl	139	9	6	6	Sandstone and shale	62	30+	Adl	Well yielded 6 gpm at depth of 133 ft. Yield increased to 30 gpm at depth of 139 ft.
Cm 415	12M, 4.4S, 8.7E	Carl Arvela	....	1,660	Dug	18	....	....	....	Clay	10	....	H	Hole drilled 56 ft below bottom of dug well does not yield water.
Cm 416	12M, 4.9S, 7.9E	E. J. Read	1948	1,600	Drl	125	25	5	24	Sandstone and shale	59	8	H	
Cm 417	12M, 5.6S, 8.1E	George Robbins	....	1,620	Dug	25	25	36	....	..	18.0 6–18–52	....	H	
Cm 418	12M, 7.2S, 7.8E	Michael R. Nester	1949	1,310	Drl	46	46	6	....	Gravel	11	40	H	Well yielded 40 gpm for 2 hrs.
Cm 419	12M, 5.4S, 7.2E	Jeff Smith	....	1,600	Dug	25	25	36	....	..	3	....	H	
Cm 420	12M, 6.5S, 8.2E	Gladys Garrison	....	1,630	Dug	4	4	36	....	Gravel	Flows	....	H	
Cm 421	12M, 6.2S, 8.2E	Elwood Langdon	....	1,670	Dug	33	18	40	18	Sandstone and shale	12	....	H	
Cm 422	12M, 8.6S, 6.7E	Harry Grover	....	1,140	Dug	36	36	....	....	..	10	....	H	Well supplies 2 families. (a).
Cm 423	12M, 7.8S, 7.0E	George Force	....	1,180	Drv	23	....	1¼	....	..	8	....	H	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 424	12M, 6.4S, 6.6E	Frank Elston	....	1,310	Drl	21	21	6	....	..	Flows	....	CH	
Cm 425	12M, 3.3S, 9.0E	Edward Cooke	....	1,010	Dug	30±	....	36	....	..	15	....	Adl	
Cm 426	12M, 3.8S, 9.0E	J. H. Keckman	1910	1,360	Drl	125	....	6	5±	Sandstone and shale	20±	....	H	
Cm 427	12M, 3.6S, 8.8E	do.	1949	1,100	Drl	133	34	6	33	do.	30	6	Adl	Well yielded 6 gpm at depth of 65 ft. No increase below 65 ft. Well is never dry.
Cm 428	12M, 7.5S, 5.9E	Floyd Chapman	....	1,400	Dug	6	6	36	....	Gravel	..	....	Adl	
Cm 429	12M, 7.1S, 6.3E	Edward Nero	....	1,510	Dug	8	8	36	....	..	4	....	H	Well flows after heavy rains. Well bottomed on rock.
Cm 430	12M, 6.8S, 8.5E	Andrew Larison	....	1,685	Dug	38	38	36	38	..	22	....	Adl	Well bottomed on rock. Several springs on property.
Cm 432	12M, 4.3S, 9.5E	Roy Wood	....	980	Drv	12	....	1¼	....	Gravel	..	4+	Adl	Three other similar driven wells on farm.
Cm 434	12M, 5.6S, 10.0E	Robert Harmon	....	964	Drv	11	....	1¼	....	do.	6	5+	H	Water has high iron content.
Cm 435	12M, 7.6S, 9.9E	Charles Strope	....	950	Dug	18	18	36	....	..	11	....	H	Water level is very low in dry season.
Cm 436	12M, 7.7S, 8.6E	Roland Brink	....	1,610	Drl	157	75±	6	75	Sandstone and shale	12	5+	Al	
Cm 437	12M, 7.9S, 8.8E	Frank Schlier	1952	1,650	Drl	145	12	6	10	do.	50	7½	H	
Cm 438	12M, 8.6S, 7.2E	Fitz Maurice	1950	1,070	Drl	42	....	6	....	do.	3	....	H	
Cm 439	12M, 15.3S, 3.1E	George Gardner	....	824	Drl	60	60	6	....	Gravel	7	15+	Adl	Boulders encountered during drilling.
Cm 441	12M, 12.6S, 4.1E	John Gildea	....	1,680	Dug	22	22	36	....	..	20	....	H	
Cm 442	12M, 10.7S, 3.7E	Harry Hays	....	1,600	Dug	20	20	36	....	..	13.4 10-25-52	....	AC	Well supplies farm and school.
Cm 443	12M, 11.0S, 6.4E	Glenn Culver	1948	1,030	Drl	45	45	6	....	Gravel	11	14	H	
Cm 444	12M, 10.1S, 6.7E	William Grady	....	1,060	Drl	67	67	6	....	do.	9	28	H	
Cm 445	12M, 9.1S, 6.9E	Hicks Community Hall	....	1,120	Drl	54.6	17	6	15	Sandstone and shale	1	10+	H	
Cm 446	12M, 8.6S, 6.7E	Harry Grover	1952	1,130	Drl	86	71	6	71	do.	34	15	H	(a).
Cm 447	12M, 10.2S, 8.1E	Harry Barr	1947	1,520	Drl	90	....	6	....	do.	Flows	....	Al	
Cm 448	12M, 9.6S, 8.6E	John F. Boston	....	1,340	Dug	14	14	36	....	..	8	5	H	Pumping level 12 ft when pumped at 5 gpm.
Cm 449	12M, 9.8S, 9.5E	Alice Doolittle	1937	1,260	Drl	75	55	3	45	Sandstone and shale	5	10	Adl	
Cm 450	12M, 11.1S, 9.7E	John Campbell	....	1,240	Dug	16	16	36	....	..	8	3	H	
Cm 451	12M, 14.3S, 4.1E	Charles Kinsman	1951	1,190	Drl	75	58	6	56	Sandstone and shale	8	25	H	Well yielded small amount of water at 70 ft.
Cm 452	12M, 12.8S, 4.5E	George Cooper	....	1,470	Dug	12	12	36	....	..	2	....	Adl	
Cm 453	12M, 13.5S, 5.2E	F. S. Wahnus	....	1,280	Dug	5	5	36	....	..	1	....	H	
Cm 454	12M, 13.6S, 5.1E	do.	....	1,240	Dug	30	30	36	....	Gravel	3	5	H	
Cm 455	12M, 13.8S, 5.1E	do.	....	1,100	Dug	22	22	36	....	do.	14	4	H	
Cm 456	12M, 15.4S, 4.5E	Francis Luckey	....	810	Drv	20	....	1¼	....	Gravel	..	15	Adl	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupan	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diam-eter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 457	12M, 15.9S, 6.4E	Morgan Joslin	1948	980	Drl	62	39	6	35	Sandstone and shale	27	7	H	Well yielded 5 gpm at depth of 55 ft.
Cm 458	12M, 15.1S, 6.4E	Joshua Peterson	1912	885	Drl	100	52	6	50	do.	30	20	Adl	
Cm 459	12M, 14.1S, 6.5E	Pat Tuccinardi	1942	950	Drl	50	50	6	....	Gravel	27	30	H	
Cm 460	12M, 13.1S, 7.2E	Earl Webster	....	1,000	Dug	11	11	36	....	do.	9.6 10–28–52	10	H	
Cm 461	12M, 12.4S, 7.9E	Floyd Guild	1944	1,180	Drl	109	30	6	28	Sandstone and shale	2	30	Adl	Drawdown 20 ft when bailed at 30 gpm. Water contains hydrogen sulfide.
Cm 462	12M, 11.7S, 8.2E	John Tompkins	1946	1,230	Drl	125	88	6	83	do.	9	10	H	
Cm 463	12M, 10.6S, 9.5E	Harold Mumme	1952	1,000	Drl	53	23	6	18	do.	0	8½	H	
Cm 464	12M, 11.1S, 10.2E	Lloyd Ackley	1952	940	Drl	120	68	6	65	do.	20	10	H	
Cm 465	12M, 15.5S, 3.2E	Brady's Wayside Inn	1947	810	Drl	48	48	6	....	Gravel	11	25+	Cs	
Cm 466	12M, 16.2S, 7.3E	Harry Balmer	1941	814	Drl	68+	68	6	....	do.	20	40	H	(a).
Cm 467	12M, 17.0S, 7.7E	Leon Simkin	....	795	Drl	62	62	6	....	do.	15	25+	Adl	Total hardness is 120 ppm.
Cm 468	12M, 16.4S, 8.8E	Belle Doan	....	860	Dug	15	15	6	....	do.	3	10+	H	
Cm 469	12M, 15.7S, 10.0E	Robert Mosier	1949	1,280	Drl	82	82	6	....	do.	0	18	Adl	
Cm 470	12M, 15.5S, 10.0E	Neil McIver	1949	1,310	Drl	44	35	6	34	Sandstone and shale	Flows	12	Adl	Well began to flow at depth of 32 ft. Water cloudy.
Cm 471	12M, 14.5S, 8.9E	Ray Banzhof	1920	1,150	Drl	65	10	4	....	do.	Flows	20+	H	
Cm 472	12M, 14.6S, 10.1E	Radford Haner	1944	1,560	Drl	130	12	6	10	do.	33	7	Adl	
Cm 473	12M, 13.8S, 8.7E	William Doane	1952	1,175	Drl	78	46	6	43	do.	Flows	12	H	
Cm 474	12M, 12.6S, 8.5E	Fred A. Mathews	1951	1,510	Drl	93	16	6	14	do.	40	10	Adl	
Cm 475	12M, 12.5S, 9.4E	Paul Walsh	....	1,540	Drl	233	27	6	25	do.	47	8	Adl	Well drilled to depth of 81 ft. Deepened to 131 ft in 1943 and to 233 ft in 1952. Yield increased only slightly below depth of 95 ft.
Cm 476	12M, 12.2S, 8.9E	F. J. Miller	1949	1,605	Drl	86	11	6	4	do.	50	5	Adl	
Cm 477	12M, 15.0S, 8.4E	Bertha Van Gaasbeck	....	1,060	Dug	30	30	36	....	..	6	5	H	
Cm 478	12M, 14.9S, 7.1E	Amos Hillicker	1946	1,265	Drl	125	102	6	100	Sandstone and shale	25	5	Adl	
Cm 479	12M, 14.8S, 7.2E	Arthur Hillicker	1945	1,340	Drl	80	34	6	30	do.	1	16	Adl	
Cm 480	12M, 15.8S, 7.0E	Grace Sharpsteen	1941	900	Drl	140	41	6	40	do.	55	7	Adl	(a).
Cm 481	12M, 13.1S, 0.6E	Robert Stewart	1952	900	Drl	80	72	6	60	Sandstone and shale	5	8	H	(a) (b).
Cm 482	12M, 12.8S, 0.5E	A. C. Stewart	....	900	Drl	45	45	6	....	Gravel	7	10	H	
Cm 483	12M, 12.1S, 2.5E	Jesse Gardner	....	1,400	Dug	29	29	36	....	..	4	10+	Adl	Rock close to surface near well.
Cm 484	12M, 11.9S, 3.0E	Zephaniah Decker	....	1,480	Dug	40	40	36	40	..	12	....	U	Well bottoms on rock.
Cm 485	12M, 13.1S, 6.2E	Frank Warren	1923	970	Drl	47	47	6	....	Gravel	25	....	H	Water has high iron content. Boulder encountered at 40 ft.

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 486	12M, 12.5S, 5.8E	John P. Stewart	....	990	Drv	18	18	1¼	....	..	9	....	H	Finished with drive point.
Cm 487	12M, 11.4S, 6.0E	Carl Warren	....	1,010	Drv	10	10	1¼	....	Gravel	4	....	H	do.
Cm 488	12M, 14.5S, 5.7W	George Lunderman	....	975	Drl	25	25	6	....	do.	6	6	H	
Cm 489	12M, 14.7S, 4.5W	Gertrude Bowen	1952	1,020	Drl	159	150	6	150	Sandstone and shale	35	15	H	Pumping level 125 ft when pumped 15 gpm. Water has salty taste.
Cm 490	12M, 14.8S, 4.5W	James N. Wieberg	1952	1,020	Drl	131	100	6	98	do.	20	6½	H	Well yielded water and fine sand at depth of 70 ft.
Cm 491	12M, 15.9S, 5.1W	Menzo D. Halsey	1952	1,440	Drl	57	....	6	....	do.	15	6	H	
Cm 492	12M, 15.7S, 4.7W	A. L. Adams	....	1,170	Drl	60	60	6	....	Gravel	0	5	H	Well flowed when new. Boulders encountered between 40 and 50 ft.
Cm 493	12M, 15.5S, 4.5E	Stanley Swartout	1948	1,260	Drl	80	80	6	....	do.	18	8	H	
Cm 494	12M, 15.5S, 4.0W	Willis F. Lightizer	....	1,680	Dug	22	22	48	....	..	11	....	Adl	
Cm 495	12M, 16.3S, 3.9W	Charles E. Lewis	....	1,570	Dug	20	20	36	....	Gravel	19	....	Adl	
Cm 496	12M, 16.8S, 3.7W	Elmira Star Gazette, Inc.	1948	1,884	Drl	300	20	6	3	Sandstone and shale	68	3	H	Well yielded small amount of water at depth of 45 ft.
Cm 497	12M, 16.9S, 3.3W	L. Smith	....	1,730	Drl	154	102	6	100	do.	..	5±	Adl	
Cm 498	12M, 17.1S, 4.3W	Robert Rogers	....	1,620	Drl	80±	....	6	....	..	Flows	10+	Adl	Water contains hydrogen sulfide.
Cm 499	12M, 16.5S, 4.2W	Robert L. Paterson	....	1,410	Drl	76	76	6	....	Gravel	0	10+	H	Rock 9 ft below surface in nearby excavation.
Cm 500	12M, 17.2S, 6.2W	Arthur Balmer	1943	1,320	Drl	80½	73	6	72	Sandstone and shale	Flows	35	Adl	Static water level about 20 ft above surface when drilled.
Cm 501	12M, 16.4S, 6.3W	Gordon L. Monks	1948	1,320	Drl	147	60+	6	60+	do.	30	15	H	(b).
Cm 502	12M, 16.8S, 6.5W	Jacob Bennett	....	1,300	Drl	32	10	6	8	do.	5	2	H	
Cm 503	12M, 6.9S, 4.5W	Ruth Philo	....	945	Drl	100	....	6	....	..	30	5	H	
Cm 504	12M, 7.8S, 5.6W	Charles Buckbee	....	1,210	Drl	98	34	6	32	Sandstone and shale	3	10+	C	Water bottled for sale.
Cm 505	12M, 7.8S, 4.9W	Paul Pullen	....	1,210	Drl	125	40	6	37	do.	30	8	H	
Cm 506	12M, 8.8S, 5.1W	Bessie Smejkal	1952	1,330	Drl	48	29	6	27	do.	Flows	9	H	
Cm 507	12M, 8.7S, 6.3W	Erie Vaughan	....	1,320	Drl	100	26	6	24	Sandstone and shale	40	16	H	
Cm 508	12M, 10.0S, 8.9W	Charles Brown	....	960	Drl	250	60	6	55	do.	140	2	H	
Cm 509	12M, 10.5S, 8.4W	Elmira Drive-in-Theater	....	920	Drl	104	104	6	....	Gravel	30	8	Cs	
Cm 510	12M, 10.4S, 8.4W	John J. Saxon	....	960	Drl	305	229	6	226	Sandstone and shale	70	3	H	
Cm 511	12M, 10.3S, 8.4W	Drake Mfg. Co.	....	995	Drl	70	27	6	25	do.	..	10	Is	
Cm 512	12M, 9.2S, 8.0W	Thomas Rhodes	1935	1,470	Drl	55	20	6	19	do.	10	7	Adl	
Cm 513	12M, 9.1S, 5.8W	Robert Rutty	1952	1,240	Drl	90	40	6	38	do.	10	5	H	
Cm 514	12M, 9.7S, 7.0W	Albert Storch	....	1,360	Drl	67	33	6	30	do.	0	8	Adl	
Cm 515	12M, 9.8S, 4.6W	do.	1940	1,000	Drl	70	30	6	28	do.	30	5	H	

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 516	12M, 10.1S, 4.7W	Stanley Oparil	....	990	Drl	57	57	6	....	Gravel	20	6	H	
Cm 517	12M, 7.7S, 6.3W	Henry Hartman	1932	1,400	Drl	112	22	6	20	Sandstone and shale	80	10+	Adl	
Cm 518	12M, 12.6S, 6.3W	Charles Evans	1947	1,840	Drl	160	30	6	30	do.	100	5	H	
Cm 519	12M, 12.9S, 6.2W	Charles Beecher	....	1,550	Drl	60	32	6	30	do.	Flows	8	H	
Cm 520	12M, 12.7S, 5.3W	William Haight	1947	1,250	Drl	190	80	6	78	do.	80	20	H	
Cm 521	12M, 13.5S, 7.4W	Claude May	....	1,460	Drl	125	111	6	108	do.	40	30	H	
Cm 522	12M, 13.7S, 7.7W	Carlton Evans	....	1,370	Drl	131	90	6	87	do.	..	5	H	
Cm 523	12M, 12.7S, 8.7W	H. A. Jerry	....	1,730	Drl	200	0	6	0	do.	16	15	H	
Cm 524	12M, 13.4S, 8.1W	Herbert Rockwell	....	1,440	Drl	65	65	6	....	Gravel	20	3	Adl	
Cm 525	12M, 14.6S, 6.9W	Burton O'Hare	....	1,120	Drl	89	22	6	20	Sandstone and shale	Flows	....	H	
Cm 526	12M, 17.0S, 7.7E	Chemung Spring Water Co.	....	820	Dug	5	5	96	....	Gravel	Flows	50	C	Water bottled for sale. (a).
Cm 527	12M, 15.6S, 6.7E	L. E. Straitor	1945	870	Drl	58	33	6	33	Sandstone and shale	2	12	H	Water from drilled well is softer than water from dug well on property.
Cm 528	12M, 11.2S, 6.4E	Glenn Culver	1948	1,040	Drl	45	45	6	....	..	11	14	H	
Cm 529	12M, 11.2S, 6.4E	Howard Culver	....	1,040	Dug	20	20	36	....	Gravel, sand, and silt	10	....	H	Well dry in summer of 1953. (b).
Cm 531	12M, 17.0S, 9.7E	Ray Ingham and Son	1953	775	Drl	36	36	6	....	do.	14	60	Acls	(b).
Cm 532	12M, 17.0S, 9.0E	Charles Wood	1947	790	Drl	38	38	6	....	Gravel	27	50+	Adl	Well yielded 50 gpm for 3 hrs. (b).
Cm 533	12M, 16.6S, 9.6E	Brills Restaurant	1946	800	Drl	41	41	6	....	do.	24	10+	Cs	Well yielded 10 gpm for 20 minutes.
Cm 534	12M, 16.8S, 8.7E	James Bernard, Jr.	1954	795	Drv	20	20	1¼	....	Gravel	..	5	H	Finished with drive point.
Cm 535	12M, 16.4S, 4.2E	Arthur Halstead	1927	1,040	Drl	127	68	6	67	Sandstone and shale	80	1	Adl	
Cm 536	12M, 16.1S, 4.2E	Bertha Halstead	....	965	Drl	43	43	6	....	Gravel	16	10	Adl	
Cm 537	12M, 3.2S, 11.0E	Ray Shepard	1953	1,010	Drl	60	60	6	50	Sand	40	5	H	
Cm 538	12M, 13.8S, 0.1E	J. S. Friends	1930±	960	Drl	212	190	6	188	Sandstone and shale	162	1½	Ad	
Cm 539	12M, 13.8S, 0.1E	do.	....	1,000	Drl	225	157	6	155	do.	165	2½	Al	(b).
Cm 540	12M, 15.6S, 0.5E	John D. Ward	....	822	Drv	22	....	1¼	....	Gravel	11	5	Adl	Well yielded 5 gpm for 8 hrs. Finished with drive point.
Cm 541	12M, 15.3S, 0.4E	Dalrymple Gravel & Contracting Co., Inc.	....	822	Drv	27	....	1¼	....	Sand	17	10	Cs	Drawdown small after pumping 10 gpm for 24 hrs. Finished with drive point.
Cm 542	12M, 15.2S, 0.4E	Robert E. Dalrymple	....	822	Drl	67	67	6	....	Gravel	15	....	H	
Cm 543	12M, 14.9S, 0.1E	Earl Ervay	....	820	Drv	22	....	1¼	....	do.	8	5+	H	Finished with drive point.
Cm 544	12M, 14.9S, 0.1E	do.	....	820	Drl	20	20	6	....	do.	8	100	Ai	
Cm 545	12M, 14.7S, 0.1W	DeWitt B. Tuttle	1947	840	Drl	....	....	6	....	do.	10+	10+	H	
Cm 546	12M, 14.5S, 0.6W	Frank Bly	1954	830	Drv	21	....	1¼	....	Sand	15	5	Cs	do.
Cm 547	12M, 14.4S, 0.9W	Mrs. Arthur Benedict	....	840	Drv	21	....	1¼	....	..	16	5+	H	Well and pump in basement 5 ft below land surface. Finished with drive point.

Table 4.—Records of selected wells in Chemung County.—(Continued)

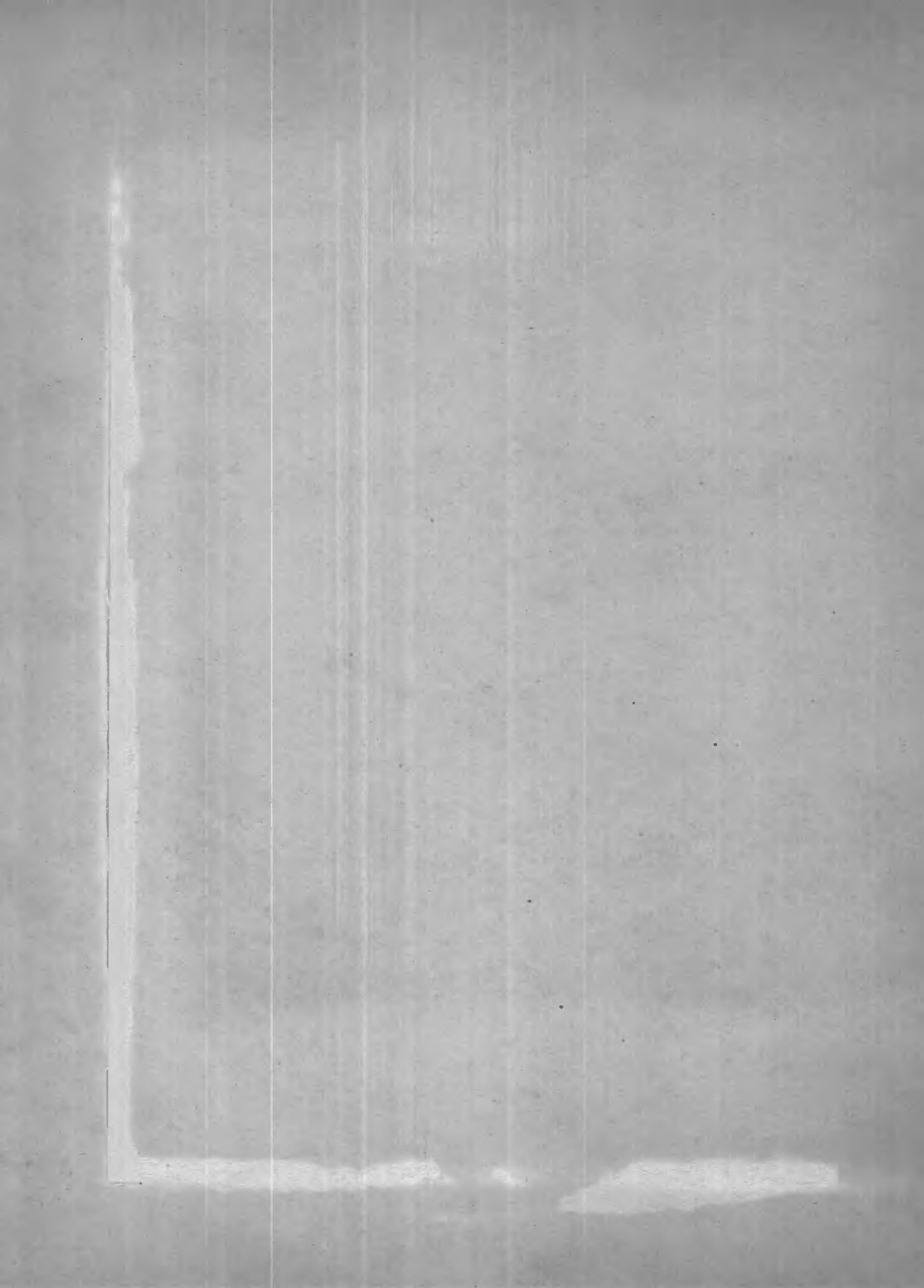
Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 549	12M, 13.9S, 1.2W	J. H. Bovier	....	840	Drv	23	....	1¼	....	Sand	12	4	H	Finished with drive point.
Cm 550	12M, 13.6S, 1.6W	David Jenkins, Sr.	1953	830	Drv	16	....	1¼	....	Sand and gravel	..	5+	H	do.
Cm 551	12M, 15.4S, 0.5E	Ben Hill	....	820	Drl	165	....	6	....	..	25	....	Adl	Drilled well in bottom of 28-ft dug well.
Cm 553	12M, 13.3S, 2.5W	James Whytock	....	860	Drv	22	....	1¼	....	Gravel	4	5+	H	Finished with drive point.
Cm 554	12M, 13.4S, 2.2W	Barbara Farley	....	860	Drv	24	....	1¼	....	do.	6	....	Cs	do.
Cm 555	12M, 14.1S, 5.2W	H. L. Cornish	1949	970	Drv	18	....	1¼	....	do.	10	25+	Adl	Other similar wells on property.
Cm 556	12M, 14.7S, 5.9W	George H. Carpenter	....	1,000	Drl	114	114	6	....	..	30	10+	H	Well yielded water and sand at depth of 70 ft.
Cm 558	12M, 4.2S, 0.2E	Lloyd Shappee	1953	1,135	Drl	65	8	6	8	Sandstone and shale	..	3	H	
Cm 559	12M, 16.7S, 6.5W	Gerald Sterling	....	1,230	Drl	118	21	6	18	do.	Flows	5+	Adl	
Cm 560	12M, 17.2S, 7.8W	Charles C. Kraus	....	1,080	Drv	38	....	1¼	....	..	10	....	Cs	Finished with drive point.
Cm 561	12M, 16.7S, 7.5W	Charles H. Reese	....	1,060	Drv	23	....	1¼	....	Gravel and sand	9	....	Adl	do.
Cm 562	12M, 15.9S, 7.2W	George Holley, Jr.	....	1,040	Drv	20	....	1¼	....	..	8	....	H	do.
Cm 563	12M, 5.5S, 0.9E	Raymond Ginther	1955	1,115	Drl	146	100	6	100	Sandstone and shale	30	1	H	Pumping level was more than 70 ft in 1954. (a).
Cm 564	12M, 5.4S, 0.7E	Town of Horseheads	1953	1,080	Drl	100	90	6	90	Sandstone and shale	6	5	U	Well drilled to depth of 135 ft. Yielded 6 gpm for 48 hrs. Water contained hydrogen sulfide; well backfilled to 100 ft. Continued to yield water containing hydrogen sulfide. Well abandoned. (b).
Cm 568	12M, 6.0S, 3.4W	Village of Horseheads	1953	895	Drl	42	36	18	....	Gravel	11.6 3-31-54	1,000	M	Finished with 10-ft length of 18-in.-diameter screen. Drawdown 5.8 ft after pumping 1,000 gpm for 8 hrs. (a) (b).
Cm 569	12M, 3.6S, 4.7W	Travelers Motor Inn	1953	940	Drl	51	51	5	....	do.	17	16	C	Quicksand at 120 ft. Casing pulled to 51 ft.
Cm 570	12M, 3.6S, 4.7W	do.	1953	920	Drl	120	120	5	....	Sand	0	....	UC	Quicksand fills casing. Prevents use of well. (b).
Cm 571	12M, 3.6S, 4.7W	Roy Grimes	1953	960	Drl	97	71	5	70	Sandstone and shale	47	10	H	(b).
Cm 572	12M, 3.6S, 4.7W	Ray Ames	1953	920	Drl	37	37	5	....	Gravel	2	6	H	Well yielded 6 gpm for 24 hrs.
Cm 573	12M, 3.6S, 4.7W	Leonard Dana	1953	940	Drl	31	31	5	....	do.	10	15	H	Well yielded 15 gpm for 24 hrs.
Cm 574	12M, 3.6S, 4.7W	Reeve Ammerman	1953	980	Drl	87	70	5	70	Sandstone and shale	35	15	H	
Cm 575	12M, 3.6S, 4.7W	Carlton Armstrong	....	960	Drl	118	86	6	....	Gravel	40	10	H	Well yielded 3 gpm at depth of 61 ft. Well penetrates rock ledge 86–103 ft. Well yielded 10 gpm for 8 hrs. (b).
Cm 576	12M, 3.2S, 4.9W	John Sopp	1953	950	Drl	98	85	6	83	Sandstone and shale	10	5	H	(b).
Cm 577	12M, 3.9S, 4.6W	Glen Stiles	1949	940	Drl	84	45	6	....	do.	..	5	H	
Cm 578	12M, 2.3S, 5.1W	Douglas Banfield	1947	925	Drl	130	....	6	....	..	6	....	Cs	
Cm 579	12M, 2.2S, 5.0W	L. H. Thrasher	1953	920	Drl	96	85	6	85	Sandstone and shale	15	4½	H	Well yielded 2 gpm at 16-ft depth. Quicksand between 50 and 65 ft contained natural gas which ignited during drilling. (b).

Table 4.—Records of selected wells in Chemung County.—(Continued)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Deph cased (ft)	Diam-eter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 580	12M, 6.5S, 3.5W	Dairymen's League Coop. Assn., Inc.	1953	900	Drl	49	40	10	....	Gravel	..	300	Ics	Well finished with 9-ft length of 10-in.-diameter screen. Well is pumped at 15 gpm continuously. (a) (b).
Cm 581	12M, 6.5S, 3.5W	do.	1952	900	Drl	50	40	10	....	do.	38	600	Ics	Well finished with 10-ft length of 10-in.-diameter slotted pipe. Initial yield of 300 gpm increased to 600 gpm after development of well.
Cm 582	12M, 6.5S, 3.5W	do.	1952	890	Drl	50	40	10	....	Gravel and sand	38	300	UI	Well finished with 10-ft length of 10-in.-diameter slotted pipe. Well yielded 300 gpm for 10 hrs.
Cm 583	12M, 2.3S, 5.1W	P. W. Niver	....	930	Drv	25	....	1¼	....	Gravel	20	5	H	Finished with drive point.
Cm 584	12M, 2.5N, 4.8W	Norton Curtis	....	615	Drv	18	....	1¼	....	do.	15	5+	H	do.
Cm 585	12M, 1.1N, 5.6W	Town of Veteran	1951	715	Drl	95	85	6	....	Sand	+4	....	C	Well finished with 10 ft of 6-in. screen. (a) (b).
Cm 586	12M, 1.1N, 4.1W	James Ratcliffe	....	880	Dug	35	35	36	....	Clay	..	....	H	Yield inadequate.
Cm 587	12M, 1.1N, 4.1W	do.	1952	880	Drl	245	245	6	....	do.	..	....	....	Trickle of water from gravel bed 4 inches thick at 21 ft. Yield did not increase below depth of 21 ft. (b).
Cm 588	12M, 0.3N, 10.9W	Beaver Valley Subdivision Corp.	1953	1,185	Drl	55	45	12	....	Gravel and sand	10	360	M	Drawdown 2-ft after pumping 360 gpm for 8 hrs. Finished with 10-ft length of 12-in. diameter screen. (a) (b).
Cm 589	12M, 8.3S, 3.3W	E. L. Phillips	1935±	870	Drl	280	280	6	....	Sand	200±	....	O	Forty ft of quicksand in well. Well is used as electrical ground. (b).
Cm 590	12M, 3.2S, 11.0E	William Palomaki	1954	1,040	Drl	96	35	6	....	Sandstone and shale	40	15	H	Well yielded 5 gpm at depth of 85 ft. (b).
Cm 591	12M, 10.7S, 2.7W	Trayer Products, Inc.	1953	850	Drl	26	26	8	....	Gravel	5	50	Ic	Finished with 3-ft length of 8-inch screen.
Cm 592	12M, 4.9S, 0.1W	C. B. West	1900±	1,190	Dug	20	20	36	....	Sand	....	....	H	Well never goes dry.
Cm 593	12M, 11.7S, 3.7W	City of Elmira	1926	....	Drl	80	....	....	80	Sand and gravel	....	....	O	Test hole. (b).
Cm 594	12M, 11.9S, 4.0W	do.	1926	....	Drl	65	....	....	60	Gravel	....	....	O	do.
Cm 595	12M, 9.8S, 2.6W	do.	1926	....	Drl	105	....	....	105	Sand and gravel	....	....	O	do.
Cm 596	12M, 9.9S, 2.6W	do.	1926	....	Drl	125	....	....	125	Sand	....	....	O	Test hole. (b).
Cm 597	12M, 13.5S, 3.5W	do.	1926	....	Drl	132	....	....	130	do.	....	....	O	Test hole. (b).
Cm 598	12M, 13.8S, 4.4W	W. S. Bazzett	....	....	Drl	60	60	6	....	do.	14	30	H	(b).
Cm 599	12M, 6.3S, 4.7W	Westinghouse Electric Corp.	1955	905	Drl	40	28	18	....	Sand and gravel	16	800	Ics	Finished with 12-ft length of 12-inch-diameter screen.
Cm 600	12M, 13.7S, 1.3W	L. P. Breese	1909	845	Drl	50	40	6	10	Sandstone and shale	15	20	Adl	Water was bottled for sale.
Cm 601	12M, 12.7S, 8.9W	Frederick Bower	....	1,720	Drl	131	....	....	....	do.	30	12	Adl	
Cm 602	12M, 7.4S, 9.4W	Town of Big Flats	1953	910	Drl	57	50	8	....	Gravel	15	50+	C	Drawdown 22 ft after bailing 50 gpm for 20 min. Finished with 5-ft length of 8-inch-diameter screen. (b).
Cm 603	12M, 7.6S, 1.5W	William McCracken	1953	1,150	Drl	64	15	5	13	Sandstone and shale	Flows	4	H	Pumping level 18 ft after pumping 4 gpm for 2 hrs.
Cm 606	12M, 6.6S, 4.5W	Dean and Lee Mill	....	....	Drl	50	....	6	....	Gravel	0	....	Is	(a).

Table 4.—Records of selected wells in Chemung County.—(Concluded)

Well number	Location	Owner or occupant	Date completed	Altitude above sea level (ft)	Type of well	Depth (ft)	Depth cased (ft)	Diameter (in.)	Depth to bedrock (ft)	Principal water-bearing material	Water level (ft below land surface)	Yield (gpm)	Use	Remarks
Cm 607	12M, 7.6S, 3.9W	Henry Stull	....	890	Drv	23	21	1¼	....	Sand and gravel	....	....	UH	Well not used; casing pulled. Formerly supplied house. (a).
Cm 608	12M, 7.6S, 4.1W	Emery H. Butts	1934	890	Drv	26	23	1¼	....	do.	6	5	H	(a).
Cm 610	12M, 7.1S, 3.8W	Bernard Dailey	....	880	Drv	25±	....	1¼	....	do.	2	....	H	
Cm 612	12M, 0.3N, 3.7W	Owen Gartland	....	1,020	Dug	21	22	36	22	..	1.4 4–17–56	....	Al	Auxiliary well, pumped infrequently. (a).
Cm 613	12M, 10.1S, 4.7W	Stanley Oparil, Sr.	1954	990	Drl	46	30	6	30	Sandstone and shale	10.4 4–18–56	10+	Ad	Temperature 48°F, 4–18–56 (meas.). (a).



REPORTS DEALING WITH GROUND-WATER CONDITIONS IN NEW YORK PUBLISHED BY THE NEW YORK STATE WATER POWER AND CONTROL COMMISSION AND PREPARED IN COOPERATION WITH THE U. S. GEOLOGICAL SURVEY

BULLETINS:

*GW- 1. Withdrawal of Ground Water on Long Island, N. Y.; D. G. Thompson and R. M. Leggette. 1936.

GW- 2. Engineering Report on the Water Supplies of Long Island; Russell Suter. 1937.

*GW- 3. Record of Wells in Kings County, N. Y.; R. M. Leggette and others. 1937.

*GW- 4. Record of Wells in Suffolk County, N. Y.; R. M. Leggette and others. 1938.

*GW- 5. Record of Wells in Nassau County, N. Y.; R. M. Leggette and others. 1938.

*GW- 6. Record of Wells in Queens County, N. Y.; R. M. Leggette and others. 1938.

*GW- 7. Report on the Geology and Hydrology of Kings and Queens Counties, Long Island; Homer Sanford. 1938.

GW- 8. Record of Wells in Kings County, N. Y., Supplement 1; R. M. Leggette and M. L. Brashears, Jr. 1944.

GW- 9. Record of Wells in Suffolk County, N. Y., Supplement 1; C. M. Roberts and M. L. Brashears, Jr. 1945.

GW-10. Record of Wells in Nassau County, N. Y., Supplement 1; C. M. Roberts and M. L. Brashears, Jr. 1946.

GW-11. Record of Wells in Queens County, N. Y., Supplement 1; C. M. Roberts and Marion C. Jaster. 1947.

*GW-12. The Water Table in the Western and Central Parts of Long Island, N. Y.; C. E. Jacob. 1945.

*GW-13. The Configuration of the Rock Floor in Western Long Island, N. Y.; Wallace De Laguna and M. L. Brashears, Jr. 1948.

GW-14. Correlation of Ground-Water Levels and Precipitation on Long Island, N. Y.; C. E. Jacob. 1945.

*GW-15. Progress Report on Ground-Water Resources of the Southwestern Part of Broome County, N. Y.; R. H. Brown and J. G. Ferris. 1946.

*GW-16. Progress Report on Ground-Water Conditions in the Cortland Quadrangle, N. Y.; E. S. Asselstine. 1946.

GW-17. Geologic Correlation of Logs of Wells in Kings County, N. Y.; Wallace De Laguna. 1948.

GW-18. Mapping of Geologic Formations and Aquifers of Long Island, N. Y.; Russell Suter, Wallace De Laguna, and N. M. Perlmutter. 1950.

GW-19. Geologic Atlas of Long Island. 1950.

GW-20. The Ground-Water Resources of Albany County, N. Y.; Theodore Arnow. 1949.

GW-21. The Ground-Water Resources of Rensselaer County, N. Y.; R. V. Cushman. 1950.

GW-22. The Ground-Water Resources of Schoharie County, N. Y.; Jean M. Berdan. 1950.

GW-23. The Ground-Water Resources of Montgomery County, N. Y.; R. M. Jeffords. 1950.

GW-24. The Ground-Water Resources of Fulton County, N. Y.; Theodore Arnow. 1950.

GW-25. The Ground-Water Resources of Columbia County, N. Y.: Theodore Arnow. 1951.

GW-26. The Ground-Water Resources of Seneca County, N. Y.; A. J. Mozola. 1951.

GW-27. The Water Table in Long Island, N. Y., in January, 1951; N. J. Lusczynski and A. H. Johnson. 1952.

GW-28. Withdrawal of Ground Water on Long Island, N. Y.; A. H. Johnson and others. 1952.

GW-29. The Ground-Water Resources of Wayne County, N. Y.; R. E. Griswold. 1951.

GW-30. The Ground-Water Resources of Schenectady County, N. Y.; E. S. Simpson, 1952.

GW-31. Records of Wells in Suffolk County, N. Y., Supplement 2; A. H. Johnson and others. 1952.

GW-32. Ground Water in Bronx, New York, and Richmond Counties with Summary Data on Kings and Queens Counties, New York City, N. Y.; N. M. Perlmutter and Theodore Arnow. 1953.

GW-33. The Ground-Water Resources of Washington County, N. Y.; R. V. Cushman. 1953.

GW-34. The Ground-Water Resources of Greene County, N. Y.; Jean M. Berdan. 1954.

GW-35. The Ground-Water Resources of Westchester County, N. Y., Part 1, Records of Wells and Test Holes; E. S. Asselstine and I. G. Grossman. 1955.

GW-36. Saline Waters in New York State; N. J. Lusczynski, J. J. Geraghty, E. S. Asselstine, and I. G. Grossman. 1956.

GW-37. The Ground Water Resources of Putnam County, N. Y.; I. G. Grossman. 1957.

GW-38. Chloride Concentration and Temperature of Water from Wells in Suffolk County, Long Island. N. Y., 1928-53; J. F. Hoffman and S. J. Spiegel. 1958.

GW-39. Record of Wells in Nassau County, N. Y., Supplement 2; Staff, Long Island Office, Water Power and Control Commission. 1958.

GW-40. The Ground-Water Resources of Chemung County, N. Y.; W. S. Wetterhall. 1959.

An asterisk (*) indicates that the report is out of print, but such reports are available for consultation in certain libraries.